**ASX Announcement**
**11 November 2024**

# New Generation Atomic Layer Deposition Machine Procured

*Specialty semiconductor equipment to accelerate the development of 2D Generation's next generation chip technology.*

**Highlights:**

- 2D Generation has ordered highly specialised Atomic Layer Deposition ("**ALD**") machine from Beneq
- Beneq is a global leader in ALD equipment with customers spanning the semiconductor and electronics industries
- New generation ALD to complement 2D Generation's current ALD and accelerate the development of its semiconductor technologies including the graphene coated interconnect
- Installation expected in 5-6 months
- 2D Generation's semiconductor IP is a critical advancement in semiconductor technology that will enable the next generation of generative AI and semiconductor solutions for data centres and beyond
- Work will continue with 2D Generation's current equipment
- Adisyn will leverage 2D Generation's innovative semiconductor solution to generate opportunities in AI1's target markets including defence applications, data centres and cybersecurity

Adisyn Ltd **(ASX: AI1)** ("**Adisyn**" or the "**Company**") is pleased to announce that 2D Generation Ltd ("**2DG**") has ordered a highly specialised semiconductor manufacturing system called an Atomic Layer Deposition Machine ("**ALD**").

AI1 entered into a binding Share Purchase Agreement to acquire 2DG, a semiconductor IP business, as announced on 4 November 2024. The companies continue to work together to identify significant opportunities to leverage 2D Generation's semiconductor solutions and industry relationships to enhance AI1's offering in its target markets. In furthering that goal, 2DG has ordered a speciality ALD from leading manufacturer Beneq, utilising funds provided by AI1. The companies have entered into a material loan agreement on terms outlined in Annexure A (**Loan Agreement Terms**).

**Atomic Layer Deposition Machine**

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.

2DG has ordered an ALD with specific benefits including:

- Liquid source precursor compatible
- Ozone source (O3) compatible
- Reaction chamber for 200 mm wafers, with substrate adapter for 100/150 mm wafers
- Plasma option, deposition temperature up to 400 degrees °C

These features will enable 2DG to achieve a high level of product readiness.

*Figure 1. Indicative Beneq ALD System*

Beneq is the home of the ALD. In 1984, Beneq established the world's first industrial production using ALD. Today, Beneq lead the market with products for R&D, semiconductor device fabrication, 3D and batch production, ultra-fast spatial ALD, and roll-to-roll ALD.

**Paul Rich, 2DG's Technology Lead, says** "we have spent months specifying the perfect ALD system for our requirements. We canvassed all the major suppliers and decided that Beneq was best positioned to deliver the system that meets our complex technology requirements. I have spent my career working within thin film deposition to advance semiconductor technology and I am confident that with this ALD we will be able to accelerate development towards a commercially viable product

that the industry needs. We are continuing development efforts with existing equipment to be ready for the new ALD installation so that we can hit the ground running."

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 which is owned by KLA Corporation (NASDAQ:KLAC, US$91B market cap), 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. Paul 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.



**Background to 2D Generation's Solution**

2DG has developed a patented solution allowing graphene coating at sub-300 degrees centigrade, an achievement that has never been successfully completed prior to 2DG. This opens the door to the next generation of semiconductors capable of further miniaturisation, lower power consumption, less heat and greater computational power.

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.

The interconnect field has emerged as a critical technological barrier hindering industry progress. Overcoming this challenge is perceived as the "Holy Grail" within the industry, promising accelerated rates and continued miniaturisation. Industry giants recognise that the entity with a viable solution stands to gain a substantial competitive advantage.

Despite large scale investment from major companies such as ASM International NV (ASMI), Tokyo Electron Limited (TEL), Lam Research Corporation and Veeco Instruments, a significant breakthrough in this domain is still elusive.

**Enter 2D Generation. With its groundbreaking innovation enabling in-situ ALD graphene deposition on the interconnect at below 300 degrees Celsius. An achievement that has never**

**been done successfully prior to 2DG. This focus on graphene integration sets 2D Generation apart, presenting a disruptive technology that has the potential to reshape the landscape of semiconductor manufacturing.**

2D Generation has already demonstrated the deposition of graphene using its existing ALD machine. However, the new ALD is much more advanced and will enable the uniform deposition – a benchmark required for the industry to enter into commercial arrangements via licences with one or multiple major semiconductor manufacturers. This technological breakthrough holds the potential to revolutionise production devices, enabling faster and more advanced chip manufacturing compared to competitors.

In doing so, the jointly developed technologies will aim to align with AI1's dual track strategy of AI enablement and advanced data centre and cyber security solutions including:

1. **Innovative AI Chips:** The partnership will focus on creating intellectual property for electronic photonic power and systems on chips (SoC) and their integration into systems in package (SiP) modules.
2. **High-Performance Computing:** Applications will target AI, data centres, high-performance computing, and other digital industries, including cybersecurity.
3. **Environmental Impact:** Addressing the scalability limitations and massive energy demands of semiconductors to reduce societal and environmental costs.

**Looking Forward**

The ALD machine is expected to be installed within 5-6 months, opening up the potential for significant additional development milestones including the uniform deposition of graphene onto a 1cm by 1cm coupon – a technological advancement that will usher in a new era of 2D materials in semiconductors. 2DG will continue development on its current ALD machine, work on collaboration opportunities and progress the ConnectingChips projects with innovation partners including NVIDIA, IMEC, Valeo, Applied Minerals, NXP, and Unity.

Chairman and CEO of 2D Generation, Arye Kohavi, says "this represents a major progression. It has taken a substantial amount of research to identify exactly what we needed to advance our solutions towards our stated commercial outcomes. Beneq is a leader in ALD machines supplying some of the biggest players in the industry, and we are excited to be working with them on our solutions for the next generation chips."

**-ENDS-**

This announcement has been approved for release by the board of Adisyn Ltd.

**Further Information:**

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**About 2D Generation**

2D Generation is an high-tech company specialising in graphene-based solutions for the semiconductor industry. Founded by experienced entrepreneurs and scientists, the company is dedicated to overcoming current technological limitations by developing faster, stronger, and more energy-efficient computer processing solutions. These advancements will support the next generation of AI, data storage, telecommunications, cybersecurity, mobile devices, and more.

**About Adisyn**

Adisyn (ASX: AI1) is a provider of managed technology services and solutions, primarily targeting the SME market. The company aims to be the preferred sovereign provider for SMEs in the Australian defence industry supply chain. Adisyn's offerings include a range of solutions tailored to this growing market segment, leveraging internal capabilities and strategic partnerships, particularly in cybersecurity and AI.

**Forward-looking statements:**

Statements contained in this release, particularly those regarding possible or assumed future performance, revenue, costs, dividends, production levels or rates, prices, or potential growth of Adisyn Ltd are, or may be, forward-looking statements. Such statements relate to future events and expectations and as such, involve known and unknown risks and uncertainties. These forward-looking statements are not guarantees or predictions of future performance and involve known and unknown risks, uncertainties, and other factors, many of which are beyond the Company's control, and which may cause actual results to differ materially from those expressed in the statements contained in this release.

The Company cautions shareholders and prospective shareholders not to put undue reliance on forward-looking statements, which reflect the Company's expectations only as of the date of this announcement. The Company disclaims any obligation to update or revise any forward-looking information, whether as a result of new information, future events or otherwise, except as required by law.

**ANNEXURE A**

**Loan Agreement Terms**

The Company and 2D Generation have entered into a Loan Agreement for the deposit of the ALD machine on the following key terms. The Company has agreed to loan US$350,000 to 2DG for the purpose of 2DG's costs associated with the deposit for the purchase of the Atomic Layer Deposition machine. There is no interest payable on the loan. In the event that Completion of the Company's acquisition of 2DG (ASX: 4 November 2024) does not occur by 28 February 2025, the loan will become due and payable by 28 August 2025. The Loan agreement contains other standard terms and conditions for an agreement of this nature.