

Black Swan Graphene and Nationwide Engineering Announce Strategic Partnership, Part of an Integrated Supply Chain, to Accelerate the Adoption of Graphene-enhanced Concrete Globally

TORONTO, March 27, 2023 /CNW/ - Black Swan Graphene Inc. ("**Black Swan**") (TSXV: SWAN) (OTCQB: BSWG) (Frankfurt: R96) and Nationwide Engineering Research and Development Ltd. ("**NERD**") are pleased to announce a strategic partnership being embedded in a fully integrated supply chain which will include Arup Group Limited ("**Arup**"), a multinational engineering consultancy headquartered in London, United Kingdom, with 18,000 experts working across 140 countries.

At the core of the partnership between Black Swan and NERD, is the completion of an equity swap where each company will own approximately five percent (5%) of the outstanding shares of the other (the "**Equity Swap**"), and the execution of a supply agreement between the two companies (the "**Supply Agreement**") under which NERD will be sourcing its graphene requirements from Black Swan.

Concurrently with the creation of the partnership between Black Swan and NERD, Arup is expected to enter into a partnership with NERD, pursuant to which it is expected to gain ownership of 4.2% of the outstanding shares of NERD. The partnerships between Black Swan and NERD, and between NERD and Arup, are intended to enhance expertise and create an integrated supply chain aimed at accelerating the adoption of graphene-enhanced concrete globally.

NERD, a spin-out company from Nationwide Engineering Group, has developed a graphene-enhanced admixture for concrete, Concretene™ ("**Concretene**"), which can significantly increase the strength of the material in mix designs, allowing for cement reduction and lowering of carbon footprint on construction projects. This is important for the global construction industry, from which cement manufacture currently accounts for approximately 8% of global CO₂ emissions. Imminent legislative requirements for decarbonisation mean the sector must act rapidly to ensure sustainability. Concretene is a graphene-enhanced admixture for concrete that has demonstrated the ability to [reduce CO₂ emissions](#) by approximately 30%, driven mainly by a significant reduction in the volume of concrete required to achieve equivalent performances. A meaningful reduction, if not an elimination, of rebar requirements, combined with a longer life cycle of the concrete, represent additional cost saving opportunities for the industry. The product has been developed in partnership with The University of Manchester's [Graphene Engineering Innovation Centre](#) ("**GEIC**").

NERD is rapidly advancing the adoption of Concretene in conjunction with the GEIC and is in advanced evaluation stage for projects with partners such as Heathrow and Manchester Airports, Network Rail, National Highways, and the Nuclear Decommissioning Authority in the United Kingdom.

Black Swan is a producer of low cost and high-performance graphene powders, derived from graphite, ideally suited for the concrete industry. Black Swan's graphene technology was originally developed by Thomas Swan & Co. Ltd. and advanced internally until the launch of Black Swan in 2021. Black Swan has indicated its intention to significantly increase its graphene production including in the graphite production facility of Nouveau Monde Graphite Inc. (NYSE: NMG) (TSXV: NOU) currently in operation in Quebec, Canada, aiming to create an integrated facility from graphite ore in the ground to graphene finished products.

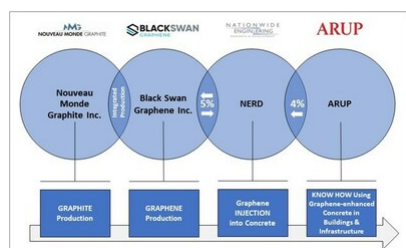
NERD and Arup Partnership

Dedicated to sustainable development, Arup Group Limited, a globally recognised design and engineering firm has been building, in partnership with the NERD, expertise and know-how on the use of graphene-enhanced concrete in buildings and infrastructure. The agreement with Arup, through [Ove Arup Ventures Ltd.](#), provides 4.2% equity in NERD in exchange for collaboration and expertise towards global roll-out of the technology. Details of Arup's extensive global portfolio, which includes the Samuel de Champlain Bridge in Montreal, Canada, may be found at: www.arup.com/projects.

Simon Marcotte, Chief Executive Officer of Black Swan Graphene, commented: "The partnerships announced today are poised to have far-reaching implications for the global concrete industry. By leveraging the exceptional performance of the NERD process and Arup's expertise, reach and leadership, this integrated supply chain can provide a turnkey solution and revolutionize the concrete industry on a global scale. Considering that concrete is the second most utilized material on Earth, surpassed only by water, it is difficult to imagine a more exciting opportunity. I am very optimistic about the impact of this collaboration and its potential to catalyze sustainable and innovative practices in the industry."

Rob Hibberd, Chief Executive Officer of Nationwide Engineering Research & Development, commented: "We are delighted to formalise these partnerships with Black Swan and Arup as part of NERD and we look forward to combining our skillsets to deliver Concretene to the construction industry in our drive to reduce global CO₂ emissions. This is further enhanced by our unique long-term research collaboration with the University of Manchester to further understand the complex world of nanomaterial technology. We see Concretene as the first product of many that this partnership will develop, with progress in paints, polymers and asphalt already in advanced stages as well."

Matt Lovell, Director at Arup, commented: "Continued innovation in the production of concrete can drive the construction industry's journey towards net zero carbon emissions. Supporting that transformative change with our NERD partnership furthers Arup's goal of shaping a better, more sustainable world. We look forward to using our commercial know-how and deep expertise in the built environment to help NERD's innovators realise the full potential of Concretene."



Black Swan Graphene and Nationwide Engineering Announce Strategic Partnership, Part of an Integrated Supply Chain, to Accelerate the Adoption of Graphene-enhanced Concrete Globally (CNW Group/Black Swan Graphene)

Equity Swap

Under the Equity Swap, NERD will issue to Black Swan 7,177 seed preferred shares (the "**NERD Shares**"), ranking senior to all other shares in the share capital of NERD, at a deemed price per share of £220 for an aggregate deemed subscription price of approximately £1.58 million or approximately CAD\$2.65M (the "**Subscription Amount**") and representing a 5.0% ownership stake in NERD on a post-money, fully diluted basis. Black Swan will pay for the NERD Shares by way of issuance of 16,371,504 common shares in the capital of Black Swan (the "**Black Swan Shares**"), representing a 5.0% ownership stake in Black Swan on a fully diluted basis. The Black Swan Shares shall be subject to a hold period of four months under Canadian securities laws and a 36-month lock-up undertaking. The issuance of the Black Swan Shares is subject to the approval of the TSX Venture Exchange (the "**TSX-V**").

Supply Agreement

Under the Supply Agreement, Black Swan will have the right, and not the obligation, to supply NERD with bulk graphene and NERD will, subject to certain terms of the agreement including pricing mechanism and technical requirements as needed by NERD, purchase bulk graphene from Black Swan in accordance with its needs (the "**Right to Supply**") and the framework of the Supply Agreement, which includes purchase orders, delivery, shipment, and risk management protocols,

as well as potential product development and R&D collaboration.

Concretene Technology and Performance

By using the unique properties of nanomaterial graphene, an atomically thin form of carbon, Concretene offers significant benefits in compressive, tensile and flexural strength, as well as faster curing times, less microcracking and reduced permeability to water and salts. This enables comparable or greater performance to be achieved in concrete design mixes while using less cement. The technology has been developed to deliver a product that is frictionless at the point of use, requiring no additional equipment or training and, most crucially of all, can be scaled at a viable cost to industry.

Graphene is exceedingly strong, light and flexible and is the most conductive material of both electricity and heat ever discovered. It is also hydrophobic by nature, which means getting it to mix, interact and disperse in a water-based material such as concrete is highly complex. Graphene has an immense relative surface area, up to 2500 m² in just one (1) gram of material, which acts as a mechanical support and as an active surface for the chemical reaction that takes place as cement paste crystallises into its permanent solid state.

High-magnification study of the finished material shows differing arrangements of crystallisation between standard and graphene-enhanced concretes, with a less porous microstructure evident in the latter. However, making effective graphene-enhanced concrete is technically challenging as, if allowed, graphene agglomerates back into clumps of graphite and loses its strength-giving properties.

Not only does Concretene have the ability to disperse evenly in large volumes of concrete, but it also demonstrates stability in solution for storage and transport. Several years of optimization work have been necessary to achieve these unique performances.

Until recently, producing graphene at a scale large enough for it to be used in real-world applications has proven challenging. But with graphene suppliers such as Black Swan able to produce material in industrial volumes, graphene is becoming a realistic option for commercial scale in construction.

Corporate Matters

Paradigm Capital is acting as an advisor for Black Swan Graphene Inc. for the transaction announced today. While no cash consideration is payable to Paradigm Capital, upon closing of the transaction, Black Swan will grant Paradigm Capital an aggregate of 1,600,000 compensation warrants with an exercise price of \$0.15 which will be exercisable for a period of three (3) years from the Closing Date, but not earlier than 18 months following the Closing Date.

Davies Ward Phillips & Vineberg ("Davies") served as legal counsel to Black Swan Graphene Inc., and Withers LLP served as legal counsel to Nationwide Engineering Research and Development Ltd. for the transaction.

About Black Swan Graphene Inc.

Black Swan is focused on the large-scale production and commercialization of patented high-performance and low-cost graphene products aimed at several industrial sectors, including concrete, polymers, Li-ion batteries, and others, which are expected to require large volumes of graphene. Black Swan aims to leverage the low cost and green hydroelectricity of the province of Québec as well as the proximity of the eventual graphite production sites of the province in order to establish a fully integrated supply chain, reduce overall costs, and accelerate the deployment of graphene usage. Black Swan's graphene processing technology was developed by Thomas Swan & Co. Ltd ("Thomas Swan") over the last decade. Thomas Swan is a United Kingdom-based global chemicals manufacturer, with a century-long track record and has been at the forefront of graphene innovation.

For more information, please visit: www.blackswangraphene.com

About Nationwide Engineering Research and Development Ltd.

Nationwide Engineering Research & Development (NERD) is a standalone R&D firm spun out from UK construction group Nationwide Engineering in 2022 by co-founders and award-winning chartered civil engineers Rob Hibberd and Alex McDermott in order to focus on bringing Concretene, and ultimately a further suite of sustainable building technologies, to market. In December 2022, NERD announced a fundraise of £8,000,000 from LocalGlobe – EMEA's most successful investor in unicorns at SEED stage¹ – for work towards full commercialisation of the technology. These funds have allowed NERD to take Tier 1 membership of The University of Manchester's Graphene Engineering Innovation Centre, a £60m state-of-the-art facility dedicated to prototyping nanomaterial technologies. NERD is also committing to a multi-million-pound sponsorship of a Chair of Construction Materials to ensure the University – and the collaboration on Concretene – remains at the forefront of understanding in this highly complex area of advanced material science.

For more information, please visit: www.nationwideengineering.co.uk

¹ According to Dealroom Investor Ranking; www.dealroom.co

About Arup Group Limited

Dedicated to sustainable development, Arup is a collective of designers, consultants and experts working globally. Founded to be humane and excellent, we collaborate with our clients and partners, using imagination, technology and rigour to shape a better world.

For more information, please visit: www.arup.com

Black Swan Graphene Inc. on behalf of the Board of Directors

Simon Marcotte, CFA, President & Chief Executive Officer

Nationwide Research and Development Ltd. on behalf of the Board of Directors

Rob Hibberd, Chief Executive Officer

Arup Group Ltd. on behalf of the Board of Directors

Matt Lovell, Director

Neither TSX Venture Exchange nor its Regulation Services Provider (as that term is defined in policies of the TSX Venture Exchange) accepts responsibility for the adequacy or accuracy of this release.

Forward-Looking Information

The information contained herein contains "forward-looking statements" or "forward-looking information" within the meaning of applicable securities legislation. Forward-looking statements or forward-looking information relate to information that is based on assumptions of management, forecasts of future results, and estimates of amounts not yet determinable. Any statements that express predictions, expectations, beliefs, plans, projections, objectives, assumptions or future events or performance are not statements of historical fact and may be "forward-looking statements" or "forward-looking information". Forward-looking statements are subject to a variety of risks and uncertainties which could cause actual events or results to differ from those reflected in the forward-looking statements, including, without limitation: risks related to the success or failure of the partnerships between Black Swan and NERD and NERD and ARUP to deliver the expected results, including the creation of a global chain of supply for graphene enhanced concrete, risks related to Black Swan's holding of the NERD Shares, including the risks related to holding shares of a start-up and related to the lack of liquidity thereof, risks related to the development of graphene enhanced concrete and other graphene enhanced components, risk related to the failure to obtain adequate financing on a timely basis and on acceptable terms; risks related to the outcome of legal proceedings; political and regulatory risks associated with the industry; risks related to the maintenance of stock

exchange listings; risks related to environmental regulation and liability; the potential for delays in development activities or the completion of feasibility studies; the uncertainty of profitability; risks related to the inherent uncertainty of production and cost estimates and the potential for unexpected costs and expenses; results of a scoping and feasibility studies, and the possibility that future results will not be consistent with Black Swan's expectations; risks related to commodity prices fluctuations; and other risks and uncertainties related to Black Swan's prospects, properties and business detailed elsewhere in Black Swan's disclosure record. Should one or more of these risks and uncertainties materialize, or should underlying assumptions prove incorrect, actual results may vary materially from those described in forward-looking statements. Investors are cautioned against attributing undue certainty to forward-looking statements. These forward-looking statements are made as of the date hereof and Black Swan does not assume any obligation to update or revise them to reflect new events or circumstances, except in accordance with applicable securities laws. Actual events or results could differ materially from Black Swan's expectations or projections.

View original content to download multimedia:

<https://www.prnewswire.com/news-releases/black-swan-graphene-and-nationwide-engineering-announce-strategic-partnership-part-of-an-integrated-supply-chain-t>

SOURCE Black Swan Graphene

View original content to download multimedia: <http://www.newswire.ca/en/releases/archive/March2023/27/c2316.html>

%SEDAR: 00030081E

For further information: Black Swan Graphene Inc., Paul Hardy, Vice President - Corporate Development, phardy@blackswangraphene.com, +1 (416) 844-7365; Nationwide Research and Development Ltd., Alan Beck, alan.beck@nationwideengineering.co.uk, +44 (0) 7788 864237; Arup Group Ltd., Fareha Lasker - PR Manager, UKIMEA, fareha.lasker@arup.com

CO: Black Swan Graphene

CNW 10:58e 27-MAR-23