



New Study Reveals HydroGraph's Fractal Graphene™ Enhances Cement Performance

Advancing Sustainability And Innovation In Construction Materials

TORONTO, Jan. 22, 2025 -- [HydroGraph Clean Power Inc.](#) (CSE: HG) (OTCQB: HGRAF) (FRA: M98) (the "Company" or "HydroGraph"), a sustainable commercial manufacturer of pristine graphene, has announced its second [research study](#) in partnership with Arizona State University (ASU) highlighting the advancements in extending the use of HydroGraph's Fractal Graphene™ into cement and concrete applications.

The report, co-authored by Ranjith Divigalpitiya, CSO of Hydrograph, validates the potential of HydroGraph's graphene in revolutionizing the construction industry, with graphene-enhanced concretes offering practical and sustainable options for high-performance applications, from ultra-strong construction materials to cutting-edge 3D printing techniques.

According to [Mordor Intelligence](#), the global cement market is expected to grow from 4.39 billion tons in 2024 to 5.96 billion tons by 2030. With cement production responsible for 8% of global carbon emissions, concrete producers face unprecedented pressure to reduce both carbon emissions and cement consumption. HydroGraph and ASU have discovered that ultra-low doses of Fractal Graphene™ (0.02%) can enable higher use of supplementary cementitious materials (SCMs) while delivering up to 70% better early-age performance.

Further, two graphene types produced by HydroGraph – Fractal Graphene™ and Reactive Graphene – were incorporated into cementitious binders at ultra-low dosages ($\leq 0.02\%$ by weight of the binder, rather than the total weight of concrete or cement mixture) in the study. The addition of HydroGraph's graphene in minimal quantities led to impressive results, including significantly improving compressive strength by up to 21% after 28-day curing. The increase in strength enables the use of less cement, while maintaining the same level of strength, with a reduction of 16.7% less cement.

"These findings support the use of HydroGraph's graphene in innovative concrete solutions, such as ultra-high-performance concretes and 3D-printed structures, while promoting sustainability," said Prof. Narayanan Neithalath of School of Sustainable Engineering and the Built Environment at State University, who led the study.

HydroGraph's graphene production method is cost-effective, environmentally friendly and scalable, addressing common barriers to its use. By reducing the cement content in concrete, graphene helps lower carbon emissions of concrete. With a potential 14% reduction in emissions, this innovation could equate to 400 million tons or 1% of global CO₂ emissions, annually.

The Global Cement and Concrete Association (GCCA) has aligned with Paris Agreement targets, committing the industry to reducing emissions 25% by 2030. More than 40 leading cement companies have joined the UN's Race to Zero campaign. Major producers have made individual commitments such as:

- Holcim has pledged carbon-neutral operations by 2050
- CEMEX is targeting 35% reduction in CO₂ by 2030
- Heidelberg Cement is aiming for carbon-neutral concrete by 2050

HydroGraph is poised to join these producers in reducing carbon emissions by pushing for sustainable concrete production practices.

"Our Fractal Graphene™ has been shown to perform very well, as an additive, in many forms of composites, leading to significant light weighting in these applications. With the present study, we are extending the applicability of HydroGraph's Fractal Graphene™ into cement and concrete applications, where we show the possibility of making high performing construction materials with significantly improved sustainability," said Kjirstin Breure, President and CEO of HydroGraph.

For more information about HydroGraph, please visit www.hydrograph.com

ABOUT HYDROGRAPH CLEAN POWER INC.

HydroGraph Clean Power Inc is a leading producer of pristine graphene using an "explosion synthesis" process, which allows for exceptional purity, low energy use and identical batches. The quality, performance and consistency of HydroGraph's graphene follows the Graphene Council's Verified Graphene Producer® standards, of which very few graphene producers are able to meet. For more information or to learn about the HydroGraph story, visit: <https://hydrograph.com/>. For company updates, please follow HydroGraph on [LinkedIn](#) and [X](#).

Forward-Looking Statements

This release contains certain “forward looking statements” and certain “forward-looking information” as defined under applicable Canadian securities laws. Forward-looking statements and information can generally be identified by the use of forward-looking terminology such as “may,” “will,” “expect,” “intend,” “estimate,” “upon,” “anticipate,” “believe,” “continue,” “plans” or similar terminology.

Forward-looking statements and information include, but are not limited to: statements in respect of the Private Placement, the use of the net proceeds from the Private Placement,

the timing and ability of the Company to close the Private Placement, if at all, the gross proceeds of the Private Placement, the timing and ability of the Company to obtain all necessary regulatory approvals, if at all, and the terms and jurisdictions of the Private Placement; the statements in regards to existing and future products of the Company; the Company’s future personnel appointments; the Company’s plans and strategies.

Forward-looking statements and information are based on forecasts of future results, estimates of amounts not yet determinable and assumptions that, while believed by management to be reasonable, are inherently subject to significant business, economic and competitive uncertainties and contingencies. Forward-looking statements and information are subject to various known and unknown risks and uncertainties, many of which are beyond the ability of HydroGraph to control or predict, that may cause HydroGraph’s actual results, performance or achievements to be materially different from those expressed or implied thereby, and are developed based on assumptions about such risks, uncertainties and other factors set out herein, including but not limited to: HydroGraph’s ability to implement its business strategies; risks associated with general economic conditions; adverse industry events; stakeholder engagement; marketing and transportation costs; loss of markets; volatility of commodity prices; inability to access sufficient capital from internal and external sources, and/or inability to access sufficient capital on favourable terms; industry and government regulation; changes in legislation, income tax and regulatory matters; competition; currency and interest rate fluctuations; and other risks. HydroGraph does not undertake any obligation to update forward-looking information except as required by applicable law. Such forward-looking information represents management’s best judgment based on information currently available.

No forward-looking statement can be guaranteed, and actual future results may vary materially. Accordingly, readers are advised not to place undue reliance on forward-looking statements.

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