

Chinachem Group Sustainability Conference 2022

Creating Social Impact on the Zero Carbon Journey in Hong Kong



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Summary

Kicking Carbon Out of Construction

- 33.8 million tonnes of CO₂ are emitted in Hong Kong every year.
- A whole life carbon approach for projects should include embodied and operational carbon emissions. However, Hong Kong's Climate Action Plan 2050 only addresses operational carbon.
- The ability to measure our greenhouse gas (GHG) emissions accurately and frequently is critical to achieving our emissions reduction goals. However, only 9% of companies are able to quantify their total emissions comprehensively.
- Our CO₂ dilemma spans the entire spectrum from demolition and excavation to superstructure and fitout.
- There are three scopes of GHG emissions in every construction project.
 - Direct emissions: diesel from vehicles, refrigerants and gasses.
 - Energy purchased and used: electricity.
 - Indirect emissions: up and down the value chain, including materials and waste.
- The construction industry is a significant contributor of emissions, including cement production (925kg CO₂ per tonne of cement produced) which accounts for 7% of global emissions; and steel production, which accounts for 8% of global emissions.
- Decarbonising construction is therefore an imperative. Some of our strategies include
 - Adopting low carbon specifications and carbon assessment tools.
 - Co-founding the "Power Up Coalition" with BEC which aims at reducing the use of diesel generators.
 - Investing in low carbon equipment, such as EV chargers and the Liebherr electric crawler crane.
 - Using modular steel struts designed for reuse for multiple projects, which produces 99kg CO₂ less than welded steel.
 - Recycling and reusing, e.g. using demolished materials for backfill.
 - Digitalisation, through the use of BIM software, e.g. Revizto at the Hong Kong International Airport.
- We have also leveraged smart technologies and digitalisation to help us reach our sustainable construction goals, such as:
 - CarbonCure technology, which reduces embodied carbon in buildings by making concrete a climate solution that removes CO₂ forever.
 - Converge's sensor technology, which reduces cube testing and hence CO₂ emissions.
 - Modular Integrated Construction (MiC), e.g. as used in Chinachem Group's Tonkin Street project.
 - Jardine Engineering Digital Insights (JEDI), a digital platform for E&M installations.
- Other ideas we are exploring to help us build a net-zero future for construction include
 - ArcelorMittal's Direct reduced iron-electric arc furnace ('DRI-EAF') steelmaking
 - AGC's first low carbon float glass range, which uses recycled glass and has a 40% smaller carbon footprint than standard float glass.
 - Sustainable timber.
 - Hydrogen fuel excavators which cut emissions by 50%.
- The question we must ask ourselves is: Are we willing to pay green premiums for green opportunities? To be a pioneer in the field?
- We must envision what we build as zero emissions developments, featuring everything from low-carbon power supply and electric powered machinery to hydrogen/other fuel cell technology to offsite construction. Our vision of these zero emissions developments should include construction materials as well, e.g. low carbon steel and concrete.
- Our latest sustainability milestones include the introduction of the first electric crane in 2022, to be used soon in the Kai Tak West project, and our first trial with CarbonCure.



CHINACHEM GROUP
華懋集團

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可持續發展論壇 2022 香港零碳之旅 · 創造社會效益



歐嘉榮
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重點

減碳建築

- 香港每年二氧化碳排放量達3,380萬噸。
- 一個完整的碳排放生命週期應包括隱含碳排放和營運碳排放。然而《香港氣候行動藍圖2050》僅強調營運碳排放。
- 要實現減排目標，必須準確並頻繁地量度溫室氣體排放量，但只有9%的公司能夠全面量化其溫室氣體總排放量。
- 建築過程中產生的二氧化碳遍及整個建築流程：從拆除、挖掘、以至樓層建構和裝修。
- 每個建築項目所產生的溫室氣體排放量，可分成三個範疇：
 - 直接排放：來自車輛的柴油、雪種和氣體排放。
 - 購買和使用能源：電力。
 - 間接排放：上游和下游價值鏈，包括材料和廢物。
- 建築業是碳排放的主要源頭，包括佔全球排放量7%的水泥生產（每生產一噸水泥便產生925公斤二氧化碳）和佔全球排放量的8%的鋼鐵生產。
- 因此，建築減碳勢在必行。我們的減碳策略包括：
 - 採用低碳規格和碳評估工具。
 - 與商界環保協會有限公司共同成立低碳約章，目的是減少使用柴油發電機。
 - 投資低碳設備：如電動汽車充電器和「利勃海爾」(Liebherr) 的電動履帶起重機。
 - 利用可在多個項目重複使用的組合鋼支柱，其產生的二氧化碳比焊接鋼少99公斤。
 - 回收和重用：例如使用拆除的材料進行回填。
 - 數碼化：通過使用「建築信息模擬」軟件，例如香港國際機場應用 Revizto軟件。
- 利用智能技術和數碼化協助我們實現可持續建築目標，例如：
 - CarbonCure技術：將混凝土變成可永久消除二氧化碳的氣候解決方案，減少建築物中的隱含碳。
 - Converge的傳感器技術：可減少混凝土強度的測試，從而減少二氧化碳排放。
 - 「組裝合成」建築法(MiC)：華懋集團東京街項目是一例子。
 - Jardine Engineering Digital Insights (JEDI)：用於機電工程裝置的數碼平台。
- 我們正探索其他方法協助構建淨零建築，包括：
 - 「阿塞洛米塔爾」(ArcelorMittal)主理的直接還原鐵電弧爐煉鋼技術「DRI-EAF」。
 - 「艾杰旭」(AGC) 的第一個低碳懸浮玻璃系列，使用再生玻璃，碳足跡比標準懸浮玻璃小40%
 - 可持續木材。
 - 可減少50%排放量的氫燃料挖掘機。
- 關鍵問題：我們是否願意為綠色契機支付綠色溢價？是否願意成為引領淨零建築的先驅？
- 我們必須為零排放建設和發展定下願景，包括低碳電源、電動機械，以至氫/其他燃料電池技術，以及工地外進行施工的各種考量。我們對這些零排放發展的願景還應包括建築材料，例如低碳鋼和混凝土。
- 我們最新的可持續發展里程碑包括在2022年推出第一部電動起重機，將在啟德西項目使用；以及首次試用CarbonCure技術。

