Office of Innovation and Industrial Relations (OIIR)

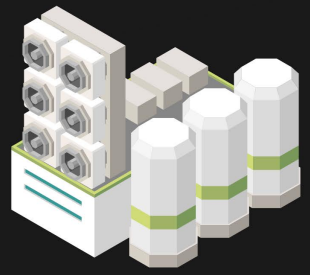
LICENSING & PARTNERING OPPORTUNITY

جامعة حمد بن خليفة
HAMAD BIN KHALIFA UNIVERSITY
عضو في مؤسسة قطر
Member of Qatar Foundation

A Two-Reactor Process for Conversion of Greenhouse Gases to Multiwall Carbon Nanotubes and Syngas

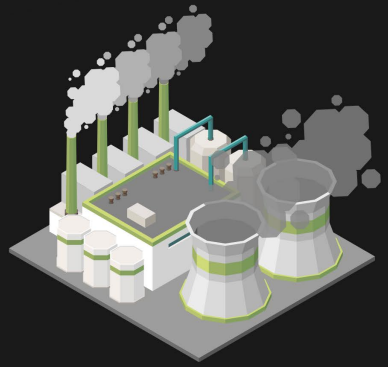
ADDRESSING SOARING CARBON EMISSIONS

Rapid increase in the world's greenhouse gas (GHG) emissions has resulted in an extensive look-out for new technologies that address this challenge. Natural gas reforming is an important building block that presents an opportunity to re-insert GHGs like CO2 and CH4 into products like synthetic fuels, alcohols, and others. Qatar Foundation's CARGEN™ technology presents a novel pathway for natural gas reforming that addresses the GHG emissions while converting them to a solid and environmentally sustainable product called multiwalled carbon nanotubes (MWCNTs).



A NOVEL AND IMPACTFUL SOLUTION

The novel CARGEN technology converts GHG emissions comprising CO2 and CH4 to MWCNTs and synthesis gas (Syngas).
It produces solid carbon from CO2 and volatile organic compounds such as methane, and a second reactor produces syngas from the gases produced in the first reactor.
Not only can the process reduce GHG emissions, but it also can produc high quality MWCNTs at much lower prices than currently available.



APPLICATIONS

- MWCNTs can be used to produce re-inforced rubber for tires and can also be used for cement, carbon re-inforced polymer fibers, steel, asphalt, batteries, fuel cells, solar photovoltaics, etc
- Extremely light and strong composites for aerospace and defense industries
- Syngas production for gas-to-liquid (GTL), hydrogen, and methanol industries

VALUE PROPOSITIONS

Synergistic: Reduces net energy requirements for producing two valuable products through an efficient two-reactor design.

Reduces CO2 emissions: Regenerates catalysts with CO2, reducing overall emissions.

Added value: Produces high-purity MWCNTs (50–100 nm diameter, up to 30 µm length) for enhanced material strength and properties.

Economical: Reduces conversion steps, making MWCNTs more affordable without compromising quality.

Improved: Surpasses natural gas reforming technologies by using CO2 as feed gas and producing syngas.

Experimentally proven: Enables at least a 50% reduction in energy requirements compared with dry reforming of methane while converting at least 65% of C02 feed gas

PATENT STATUS

US Patent 11591213 Granted,
Australian Patent AU2018249486A Granted

LICENSING OPPORTUNITIES

Hamad Bin Khalifa University is offering this technology for license.

For more information, please contact: innovation@hbku.edu.qa