
NEWS

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INDIA'S LARGEST COMPANY JOINS WA-QLD BID

TO DEVELOP WORLD'S STRONGEST MATERIAL

India's largest company has inked a provisional deal with Perth green energy developer, Eden Energy Limited (ASX: "EDE"), to test in association with researchers from the University of Queensland, the commercial potential of a form of carbon believed to be the strongest structural material known to man.

The agreement provides for the piloting of commercial-scale production of a unique molecular form of carbon known as "nanotubes", which their developers say hold significant promise for the emergence of ultra-strong, lightweight construction materials for the 21st century.

Under a non-binding terms sheet signed in India this week, the Delhi-based Indian Oil Corporation Limited (IOCL), subject to certain conditions, will farm-in to the development of a new pyrolysis technology jointly conceived by Eden and the University of Queensland. IOCL's involvement will be managed by its R&D division which operates an A\$250 million world class R&D facility at Faridabad near Delhi.

The process separates methane gas (the major component of natural gas) into its hydrogen and carbon constituents in order to manufacture tiny but "phenomenally strong" cylinders of carbon atoms.

The miniature, plastic-like nanotubes have been attracting growing attention in construction, electronics and medical circles for their unrivalled tensile strength – measured at up to several hundred times that of steel.

The nanotubes also exhibit strong electrical conductivity, near weightlessness, elasticity, and unique medical properties.

"This is really one of science's Holy Grails – to prove that carbon nanotubes can be produced in commercial quantities and at an affordable price," Eden Energy's Chairman, Mr Greg Solomon, said.

"It can open the door to literally hundreds of potential applications in the construction, electronics, transport and medical industries," Mr Solomon said.

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“These nanotubes are already used in the construction of spacecraft and the latest commercial aircraft and Formula One racing cars, but the beauty of our process is that it does not produce carbon dioxide as a by-product, only hydrogen which itself is a totally clean and very valuable fuel.

“If we can create these incredible natural building blocks from something as simple and plentiful as natural gas, and at the same time have a huge amount of hydrogen energy available to be used, we would be able to revolutionise a number of consumer industries,” Mr Solomon said.

Under today’s agreement, IOCL will provide an estimated A\$2.6-3.6 million over the next two years in a two stage process to upscale the pyrolysis project to a pilot plant capable of processing 120 NM³/hour of methane, an amount that would be sufficient to run approximately 15-20 natural gas fuelled buses on a continual basis. The first stage of this upscaling will be undertaken at the University of Queensland and the second will be done at IOCL’s R&D facility at Faridabad.

In recent years, composite materials produced from carbon nanotubes have been used in a number of specialised lightweight products, from hybrid cars to tennis racquets and ultra-light windmill blades.

But while nanotubes have been synthesized in small quantities for many years, the cost has thus far prevented large-scale commercial production other than for high cost specialised applications.

“A cost-effective, pollution-free method for producing large quantities of nanotubes would open up a virtually endless range of opportunities for their use in the production of almost anything where strength, flexibility and lightness are paramount, from building materials and cars to computers, bicycles, and ultra-strong ropes and cables,” Mr Solomon said.

“Additionally, the potential Greenhouse Gas savings that would result from the widespread use of carbon composite materials in substitution for steel and aluminium would be likely to be enormous.”

“These tiny tubes which measure between 2-20 millionths of a millimetre in diameter – also show a remarkable ability to absorb nearby molecules, generating numerous other potential uses in environmental cleanups and water and chemical purification.”

Researchers working on the Eden-University of Queensland project, with financial support from the Australian Research Council, have identified a new process, for which patent applications have been applied for in over 50 countries, under which methane molecules will separate to form hydrogen, solid carbon powder (commonly known as “Carbon Black”), carbon fibres and multi-walled and single-walled carbon nanotubes.

Under the terms of the arrangement with IOCL, Eden will purchase the University of Queensland’s 50% interest in the patents and intellectual property developed by the pyrolysis project for shares in Eden, and will then transfer this interest to IOCL after the latter has upscaled the technology to a pilot plant stage.

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Upon completion, Eden and IOCL will jointly own the intellectual property rights to the pyrolysis technology, together with the rights to its eventual commercialisation.

As India's national oil company and its largest commercial enterprise, IOCL had a sales turnover in 2008-09 of more than A\$60 billion – the highest ever for an Indian company.

IOCL has been designated by the Indian Government as the primary agency to develop the country's "Hydrogen Roadmap", which aims to have 20% of all vehicles, or at least one million vehicles running on hydrogen based fuel on India's roads by 2020.

Under this Hydrogen Roadmap, Eden Energy's US patented Hythane® blend of hydrogen-enriched natural gas has been adopted as the transitional fuel for the country's vehicle industry, with the first public Hythane® station which was built by Eden's US subsidiary for IOCL, having been completed in Delhi last year.

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