

## AUSTRALIAN SECURITIES EXCHANGE ANNOUNCEMENT

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# **EDEN ENERGY SIGNS TERMS SHEET WITH INDIA'S LARGEST COMPANY TO DEVELOP GROUNDBREAKING HYDROGEN AND SOLID CARBON PRODUCTION TECHNOLOGY**

## **HIGHLIGHTS**

**Eden Energy ("Eden") has executed a non-binding terms sheet with Indian Oil Corporation Limited ("IOCL") through which, subject to certain conditions being satisfied, the two companies will enter into a farm-in agreement to scale up a new Pyrolysis technology jointly developed by Eden and the University of Queensland, to produce hydrogen and ultra-strong solid carbon fibres and nanotubes from methane gas.**

## **DETAILS**

### **Terms Sheet signed with IOCL**

After extensive negotiations, Eden has secured agreement with Indian Oil Corporation Limited (IOCL) on the terms of a detailed non-binding terms sheet for IOCL to farm-in to the new pyrolysis technology developed jointly by Eden and the University of Queensland with support from the Australian Research Council. Through this technology, methane (natural gas) is broken down into its atomic constituents of hydrogen gas and solid carbon, without the production of carbon dioxide, to produce carbon fibres and nanotubes that exhibit tensile strengths up to several hundred times greater than that of steel. If successfully piloted on a commercial scale, the process could have important implications for the widespread commercialisation of these ultra-strong forms of carbon that can be used in composite materials for the construction, electronics, aerospace and vehicle building industries.

IOCL, India's flagship national oil company and downstream petroleum major, is India's largest commercial enterprise, with a sales turnover in 2008-09 of more than A\$60 billion – the highest-ever for an Indian company. It is also the highest ranked Indian company in the prestigious Fortune 'Global 500' listing, having moved up 11 places to 105<sup>th</sup> position in 2009. IOCL's involvement in the farm-in agreement will be managed by its R&D division which operates an A\$250 million world class R&D facility at Faridabad near Delhi.

In 2005, the Indian Government designated IOCL as the core agency for developing the “Indian Hydrogen Roadmap” and promoting the use of hydrogen and HCNG or Hythane®, a blend of hydrogen-enriched natural gas, for transport and electricity generation in India. In this role, IOCL in 2008 engaged Eden’s wholly owned US subsidiary, Hythane Company, to build for IOCL the first public Hythane® station in India, at Dwarka near Delhi (see Figures 1 and 2).



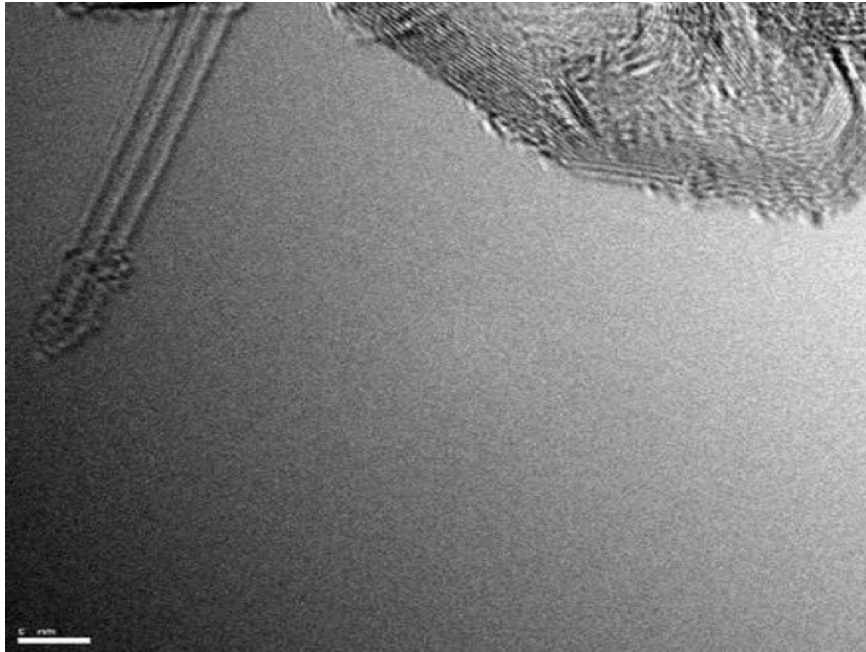
**Figure 1 First Public Indian Hythane® Station and First Hythane® Fuelled Car**



**Figure 2 Signboard at the Dwarka Hythane® Station showing HCNG (Hythane®)**

## The New Pyrolysis Technology

Unlike most hydrogen production technologies, the new Pyrolysis technology developed by Eden and the University of Queensland has the very significant advantage of not producing carbon dioxide as an unwanted by-product. Instead, this technology produces only hydrogen and solid carbon powder (commonly known as “Carbon Black”), together with, under certain conditions, carbon fibres and multi-walled and single-walled carbon nanotubes (See Figure 3).



**Figure 3**

**SEM Image of Single Walled and Multi Walled Carbon Nanotubes Produced at University of Queensland- scale bar is 5 nanometres (5 millionths of a millimetre)**

Carbon fibres and carbon nanotubes have enormous tensile strength, as well as being exceptional conductors of electricity, and are currently used in super-strong, ultra-light carbon composite materials that are deployed extensively in the production of the latest fuel efficient airliners (Airbus A380 and Boeing 787) and in Formula 1 racing cars. However, current production methods are expensive, which has thus far limited the widespread commercial use of these materials.

The new pyrolysis process, if successfully scaled up from the existing laboratory scale to commercial production, could open up large commercial markets for these high value carbon composite materials in the structural materials markets, where they could potentially displace both steel and aluminium in many applications. Additionally, the potential Greenhouse Gas savings that would be likely to result from the widespread use of carbon composite materials in substitution for steel and aluminium could be very significant.

## **Preliminary Agreement to Purchase UQ's Interest and Details of Terms Sheet**

Eden has reached a preliminary in-principle agreement with the University of Queensland ("UQ") for Eden to purchase from UQ, in consideration of the issue to UQ of 3,750,000 fully paid ordinary shares in Eden, its 50% interest in the patents and intellectual property developed by this project.

This acquisition will enable Eden to satisfy the provisions of the Terms Sheet with IOCL, which require Eden to transfer to IOCL a 50% interest in the new technology upon IOCL firstly funding the up-scaling of the technology by approximately 18 times, to a bench scale size of 120 litres of methane per hour, and then a further thousand-fold up-scaling to a pilot plant capable of processing 120 NM<sup>3</sup>/hour of methane, which would be enough methane to run between 15-20 natural gas fuelled buses on a continuous basis. The total cost of these two phases has been estimated at approximately A\$2.6-3.6 million.

The Terms Sheet with IOCL contains a number of conditions precedent, including IOCL being satisfied with both a demonstration of the technology at UQ, and with Eden's and UQ's right to ownership of the intellectual property, and their right to commercialise it.

It is hoped that the acquisition by Eden of the UQ interest will be completed and the conditions precedent to the Terms Sheet will be satisfied over the next 2-3 months and that a formal binding Farm-in Agreement with IOCL will then be executed, pursuant to which the up-scaling process will begin. It is estimated that this up-scaling process would take between 18-24 months to complete.

### **Conclusion**

Subject to completion of the preliminary matters detailed above, Eden will secure a highly capable and strategically placed major partner with which to undertake the development and commercialisation of this groundbreaking and extremely promising carbon technology, effectively leaving the hydrogen as a very cheap but valuable by-product.



**Gregory H Solomon**

*Executive Chairman*

For further information please contact Greg Solomon (+614 0206 0000) or visit our website ([www.edenenergy.com.au](http://www.edenenergy.com.au))