

ADNOC Implements Unique Projects to Reduce Carbon Emissions

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Abu Dhabi- The Abu Dhabi National Oil Company (ADNOC) will implement all its future projects according to the framework of the Kyoto Agreement's Clean Development Mechanism (CDM) related to the reduction of carbon emissions.

Applying this in line with the directives of H.E. Yousef Omair bin Yousef, Secretary General of the Supreme Petroleum Council (SPC) and CEO of ADNOC, the company will be cooperating with the **Abu Dhabi Future Energy Company {MASDAR}** and **Environment Agency-Abu Dhabi {EAD}**.

"This measure comes after achieving 80% success in reducing carbon stack emissions over the last 12 years as well as the tangible and advanced steps taken in CO₂ recovery and using it to enhance oil recovery in reservoirs in addition to conserving energy consumption in operations, according to a report published by latest issue of ADNOC News magazine.

The report gives synopsis about some of projects and their contribution to sustainable development being executed by Ruwais Fertilizer Industries (FERTIL), TARKREER, **ADGAS**, **TOTAL ABU AL BUKHOOSH** and **GASCO**.

Recovery of CO₂ from the Flue Gases for Productive Use in the Synthesis of Urea at FERTIL's Integrated Ammonia-Urea Facility in Ruwais The purpose of FERTIL's CDM project is to recover CO₂ from flue gases for productive use in the synthesis of Urea, thus reducing the atmospheric emissions of CO₂.

FERTIL operates an integrated ammonia-urea complex in Ruwais industrial zone in the emirate of Abu Dhabi. Since initiation in 1983, the facilities have utilized lean associated gas suppliers from the onshore oil fields to produce fertilizers and market them locally and internationally.

In the production process, natural gas feed is reformed to produce hydrogen and CO₂. The hydrogen then reacts with nitrogen (which is captured from air) to form ammonia, which is further synthesized with CO₂ into urea. As the lean associated gas utilized as feedstock has a low Carbon to Hydrogen Ratio (CHR), the CO₂ produced as a by-product from the reformation process is insufficient to convert all the produced ammonia into urea. As a result of the shortage of CO₂ in the production facilities, surplus ammonia has been marketed as long as the plant has been in operations.

The proposed CDM project installs a Carbon Dioxide Recovery (CDR) plant to recover additional CO₂ that is currently vented CO₂ with flue gases; this recovered CO₂ is then used to convert all the produced ammonia into urea.

An EPC was awarded in August 2007, and the construction of the CDR plant and increase of synthesis capacity of FERTIL's urea plant in Ruwais will be finalized in time for commissioning of the project in Q3 2009.

Expected start date of the project: Phase I: Q3, 2008, Phase II: Q4, 2009.

Reduction of Gas Flaring Through routing of Excess Fuel Gas in LNG Train 3 to LNG Trains 1 & 2 in ADGAS' LNG Plant on Das Island – **ADGAS**. The purpose of the project is to reduce waste of natural resources and thus atmospheric emissions of CO₂ through routing of previously flared, excess fuel gases in LNG train 3 for productive use as fuel gas in LNG trains 1 & 2.

The fuel gas available from the fuel gas system in train 3 continuously exceeds the train's fuel requirement. As a result, **ADGAS** has been flaring excess fuel gas from train 3 on a continuous basis.

The project comprises installation of an interconnection to route excess fuel gas in train 3 for productive use in the steam generation boilers in trains 1 & 2. If the CDM project is successfully implemented, gas from two additional sources of flaring could be recovered for inclusion into the train e fuel gas system. Without the proposed CDM project activity, recovery of these two sources into the train 3 fuel gas system would merely represent a relocation of the point of flaring.

The proposed interconnection between train 3 and trains 1 & 2 provides the opportunity to utilize gas from these two sources for productive use when it is recovered.

The targeted start of operation of the proposed project activity is Q3 2009 **ADGAS** Recovery of Flash Gases from the Acid Gas Removal Processes in Trains 1 and 2 at Das Island for Productive Use as Fuel Gas in SRU Incinerators.

The objective of the project is recovery and productive use of previously flared flash gases in the existing incinerators of the Sulphur Recovery Units (SRUs) in the LNG trains 1 and 2 at Das Island.

Each of the three LNG trains in Das Island is equipped with an acid gas removal process which consists of two stages. The 1st stage uses potassium carbonate (Carbonate) for bulk removal of the acid gas, while the 2nd stage uses diethanolamine (DEA) for final acid gas removal. The flash gases from the Carbonate and DEA flash drums have historically been sent to the sour gas flare headers in the respective trains for continuous flaring.

The project consists of two identical modifications to each of the acid gas removal processes in train 1 & 2. Each modification comprises installation of new piping and a new sour fuel gas knock out drum. As a result of the project activity, the previously flared flash gases can be recovered and utilized to partially substitute for the sour fuel gas that is currently being burnt in the SRU incinerators in trains 1 and 2, respectively.

Recovery and Utilization of Low Pressure Gas at New Khuff Production Platform by TOTAL ABK : The project envisages to recover and utilize tail gas from FRU which will be newly implemented at the New Khuff Production Platform (NKPP) offshore facility.

The purpose of the project is to reduce the flaring of hydrocarbon gas thus, reducing CO₂ emissions. The project activity involves the recovery of the low pressure flare gases that historically have been flared at New Khuff Production Platform (NKPP) offshore facility. The recovered low pressure gas at NKPP facility is a mix of six (6) gas streams.

The previously flared hydrocarbons (8.2 MMSCFD or 232, 198 M³/day in total) will be compressed to 8.5 bars in a two stage compressor and will be sent to Khuff Production Platform (KPP) offshore facility to join the high pressure gas pool to be further compressed and exported to ADGAS LNG plant at Das Island. Accordingly, the project activity will have significant impact on the gas flaring reduction at NKPP facility.

Flare Reduction Compressor (FRC) package will recover the low pressure flare gases and compress it to a higher pressure that would allow it to flow to the suction line of the main gas compressor (GRC). FRC package encompasses the installation of the interconnection pipelines as well as the installation of process equipments.

Reducing the Volume of the Flared Natural Gas in Onshore Sites **GASCO**: The objective of the project is to reduce the natural gas in **GASCO** flares in Asab, Bab and Bu Hasa sites by installing instrument to control the speed of the high amount used to maintain adequate pressure in the flares network. By implementing this project, the use of natural gas in flares will be reduced and the emissions will be by 13,995 ton/year with effect from October 2008.

This project will help in energy conservation and saving in the used natural gas which will be utilized in other more important alternative purposes. New technology used for reducing Carbon Dioxide emissions as a result of burning the gases.

There are a number of other projects being conducted by ADCO, ADMA-OPCO, ZADCO, TAKREER and ADOC.

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