

# OCTAVIUS: A New FP7 Project Demonstrating CO<sub>2</sub> Capture Technologies

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## Abstract

The OCTAVIUS project (Optimisation of CO<sub>2</sub> Capture Technology Allowing Verification and Implementation at Utility Scale) will start on March 1<sup>st</sup> 2012 for a period of 5 years, as part of the 7<sup>th</sup> framework programme of the European Commission<sup>1</sup>. Gathering 17 partners comprising 15 European partners and 2 South African partners, the OCTAVIUS project was conceived as contributing to demonstration of integrated concepts for zero emission power plants covering all the components needed for power generation as well as CO<sub>2</sub> capture and compression facilities.

OCTAVIUS gathers the leading organisations within the field of CCS and clean coal, covering the whole value chain from research institutes to end-users. The consortium consists of 5 research organisations, 2 universities, 1 SME, 1 engineering company, 2 equipment suppliers, and 6 power generators.

OCTAVIUS builds upon previous FP6 and FP7 CCS projects such as CASTOR and CESAR. The main coordinating research institutes and industrial partners of these projects also take part in OCTAVIUS. Results of the clean coal research are provided by end-users, engineering companies and technology vendors partnering in OCTAVIUS.

The objectives of the OCTAVIUS project are the following:

- to demonstrate operability and flexibility of first generation post combustion processes on pilot plants in preparation of full scale demonstration projects such as the ROAD and Porto Tolle projects. Experimentation will be carried out on 3 different industrial pilot plants (TNO pilot at Maasvlakte, ENEL pilot at Brindisi, EnBW pilot at Heilbronn). Based on the results of the pilot campaigns, OCTAVIUS will establish detailed guidelines with relevant data on emissions, operability, flexibility and cost aspects as well as HSE issues, for first generation CO<sub>2</sub> capture processes.
- to demonstrate the DMX<sup>TM</sup> process on the ENEL pilot plant at Brindisi which will be retrofitted. This second generation capture process issued from IFPEN researches uses phase change solvents and aims at an energy consumption of around 2.3 MJ/kgCO<sub>2</sub> captured. So, it can enable a substantial reduction in the energy penalty and operational costs. The demonstration is an essential step before the first full scale demonstration envisaged to be launched at the end of OCTAVIUS. Application to coal power stations but also NGCC will be considered within OCTAVIUS.
- to establish guidelines for commercial scale demonstration units in South Africa. Participation to the project of ESKOM and EcoMetrix will help these South African companies to envisage the appropriate frame for such demonstration units in South Africa through exchange with the European partners.

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The paper will present in detail the organisation and objectives of the project, its main expected outcomes and the first results obtained in Year 1. These first results will be highlighted as follows:

- evaluation and establishment of the tools to be used for steady state simulations, dynamic simulations and cost estimation. These tools will be used to interpret the results of experimentation to be carried out on the different pilot plants and also to realise the benchmarking studies.
- results of the first campaign to be carried on the TNO pilot plant at Maasvlakte. Target of this 6 weeks campaign will be mainly emission control and reduction. Special attention will be paid to emission of by-products from solvent degradation. The TNO pilot plant is well modelled and there is a lot of experience with the operation of this plant from previous projects such as the Dutch National project CATO.
- preparation of the ENEL pilot plant retrofit for demonstration of the DMX<sup>TM</sup> process through experiments on mini-pilots and cold mock-up. Results of these experiments will be used to complete technical definition and estimation of the retrofit project.

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