

## OBJECTIVES

- Confirm the concept for a coal Gasification Enabling Module (GEM) that will produce syngas for existing natural gas fired combined cycle (NGCC) power plants at a price competitive with natural gas and that can reduce carbon emissions by 85% or more.
- Advance the existing technical documentation for the concept to a more developed stage.
- Develop more accurate costs and economics for the concept.
- Further evaluate the economic potential of new adsorbents for the capture of CO<sub>2</sub> and mercury.
- Increase the understanding of the implications of firing coal derived gases as a retrofit fuel option for an existing NGCC plant.

## SUMMARY

The primary aim and objective of the work is to develop the technical and economic information that will assist existing or future owners and investors in the power industry to evaluate the advantages of utilising coal based syngas generated in a Gasification Enabling Module (GEM) to refuel existing NGCC plants which have the capability to remove 85% or more of the CO<sub>2</sub> prior to combustion. To achieve this objective, the study will evaluate GEMs located both adjacent and remote from existing NGCC plants and will evaluate the performance of the GEMs both before and after carbon capture. The results to date on these flow schemes are based on preliminary conceptual technical evaluations and preliminary cost estimates.



Wabash Coal Gasification Plant in Indiana USA

The objectives of the proposed engineering work are to:

- Advance the technical concept and documentation to a more developed stage suitable to more fully technically define the plant configurations and support much improved capital cost estimates.
- Develop improved capital and operating cost estimates to replace the existing preliminary estimates.
- Develop the economics to demonstrate the production of syngas as a potentially cheaper substitute for natural gas for stranded gas turbine based power plants with and without the impact of carbon capture credits.

In parallel, R&D work is proposed to further evaluate the ability of selected solid adsorbents to capture CO<sub>2</sub> at higher loadings than currently utilised liquid systems while maintaining a high desorption pressure to save on CO<sub>2</sub> compression costs. Also, the absorption capacity of new mercury adsorbents will be briefly examined with the objective of achieving adsorption loadings high enough to allow economic regeneration and recovery rather than disposal as is currently done.

**Further information on the Cleaner Fossil Fuels Programme, and copies of publications, can be obtained from:**

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## COST

The total cost of the project is £1,074,000 with the Department of Trade and Industry (DTI) contributing £639,000 and £435,000 is the balance.

## DURATION

12 months from October 2004 to October 2005.

## LEAD CONTRACTOR

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