



## Coal to gas substitution using coal?!

Thomas Kempka (1) and Ralph Schlüter (2)

(1) Helmholtz Centre Potsdam, German Research Centre for Geosciences (GFZ), Potsdam, Germany  
(kempka@gfz-potsdam.de), (2) DMT GmbH & Co. KG, Essen, Germany (ralph.schlueter@dmt.de)

Substitution of carbon-intensive coal with less carbon-intensive natural gas for energy production is discussed as one main pillar targeting reduction of anthropogenic greenhouse gas emissions by means of climate change mitigation. Other pillars are energy efficiency, renewable energies, carbon capture and storage as well as further development of nuclear energy.

Taking into account innovative clean coal technologies such as UCG-CCS (underground coal gasification with carbon capture and storage), in which coal deposits are developed using directional drilling technologies and subsequently converted into a synthesis gas of high calorific value, the coupled conceptual approach can provide a synergetic technology for coal utilization and mitigation of carbon emissions.

This study aims at the evaluation of UCG's carbon mitigation potentials and the review of the economical boundary conditions. The analytical models applied within this study are based on data available from world-wide UCG projects and extensive laboratory studies.

In summary, scenarios considering costs and carbon storage potentials are economically feasible and thus competitive with less carbon-intensive energy generation technologies such as natural gas. Thus, coal to gas substitution can be one of the coal based options.