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THE CURRENT RESEARCH AND SCIENTIFIC POTENTIAL OF THE CENTRAL MINING INSTITUTE (GIG) IN THE FIELD OF UNDERGROUND COAL GASIFICATION (UCG)

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The underground coal gasification technology (UCG) has recently gained considerable attention worldwide as an alternative option of coal recovery, especially from unmineable coal deposits, abandoned for operational or economic reasons. It is the process of direct in-situ conversion of coal deposits to gaseous energy carriers or to synthesis gas. Although the concept of UCG is not new but dates back about 100 years, renewed interest the UCG technology has recently occurred in most coal producing regions of the world. This coal extraction technology is believed to increase the amount of coal in the energy balance, while providing the sufficient level of economic, safety and environmental protection. Therefore it is of special interest to Poland with the energy sector based predominantly on coal.
The Central Mining Institute (Poland) resumed research in the field of UCG in 2007 in the frames of the project entitled: *Hydrogen Oriented Underground Coal Gasification for Europe* (HUGE). Within the HUGE project supported by EU RFCS, and completed in July 2010, a wide range of gasification tests were undertaken, from experiments in blocks of coal, both underground and in surface rigs, to high pressure simulations in surface tests. The experiments were supported by small-scale laboratory work, environmental studies and modeling. The HUGE project has demonstrated theoretically, and experimentally in seam, that syngas with high hydrogen content can be produced. However, safety and environmental aspect of the UCG are of the utmost importance when planning research and industrial-scale UCG applications. These issues are currently the subject of the further research in the framework of HUGE2 project, which is oriented mostly on environmental and safety aspects of the UCG technology. In this paper, general results of research and scientific potential of GIG in the field of UCG are presented.