

RESEARCH ON THE COAL BENEATH THE NETHERLANDS

V – SUMMARY AND CONCLUSIONS

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The applicability of new methods to utilize coal resources can be judged only on the basis of sufficient advance knowledge of geological conditions of the occurring coal seams and their structure. A modern reconnaissance of coalbearing Carboniferous in The Netherlands is under way (DE VOOGD & STAUDT, this issue).

In the second place it is expected to keep an eye on developments in the sphere of advanced mining methods as shown by ROEST (this issue), by maintaining existing contacts of the Mining faculty of the Delft University of Technology with the mining industry across the borders so that it will be possible to judge the merits of resuming the extraction of coal in The Netherlands if and when this should appear worth considering.

A third paper (DOZY, this issue) deals with the multidisciplinary research into the possibility of Underground Coal Gasification (UCG). Belgian, German and French efforts are presently aimed mainly at extending USA methods to greater depth. This approach has certain disadvantages: wellspacing and fracking distances must be enlarged or stretched to their limits in order to improve gas recovery through vertical holes. Also the application of high pressure for fracking, the installation of special equipment for linking by retrocombustion, and finally the layout for normal forward gasification are probably costly and time consuming. There might thus be merit in having another overall look at the European problem of working with thin and deep seams. A crucial problem under these circumstances is to reach with one borehole a large enough supply of coal to maximize gas recovery per well. Directional drilling within a seam might be a better approach than vertical borings because of its much greater penetration as compared with fracking.

Grubbing proposed a method based on the use of holes deviated into a coal seam. COPPES (this issue) has shown that boreholes deviated horizontally over a few hundred meters are possible in practice. The question can be asked, however, how long an uncased horizontal borehole in a coal seam would

remain open? What happens with such a reaction chamber at depth under high temperature and stress? The behaviour of the country rock enclosing thin seams is also involved. VAN BAAREN & KETTING's project (this issue) is a first step towards finding answers to such questions. DIETZ & BRUINING (this issue) have demonstrated the importance of heat losses, not only into the country rock around the reaction chamber but also in the relatively very long outlet tubes between reaction chamber and surface installations. Dietz and Bruining hope to continue their study towards controlling the temperature of the reaction zone and the product gas.

In this general line of thought there remain many questions as yet unanswered: over what distance can a longwall type of gasification be effected and maintained and under what temperature in relation to the strength of the country rock? Could some models be visualized on the basis of directionally drilled holes, perhaps with sidetracks, aimed at gasifying a maximum amount of coal per well?

In the introduction the desirability of stimulating research into UCG was mentioned in order to be also in a position to benefit from developments abroad. In that respect it is necessary to develop the modest beginnings reported upon towards contributions which are regarded to be of sufficient interest in a W. European context. Because of the high cost, field experiments should be conducted preferably within the framework of a European cooperation. An internationally highly valued Dutch scientific contribution is needed to participate actively and to avoid being merely financial supporters. After having caught up some of the research backlog, it is possible to become an acceptable partner.

What are the chances that research efforts into the feasibility of underground coal gasification will lead to an economic viable commercial mining process? Clearly, they are small indeed, may be only one in five. It will probably take a few decades to find an answer, either a positive or a negative one. Expenditure on such risky long term multidisciplinary research is nevertheless justified because the stakes are high: a new local energy source and the infrastructure that will support it.

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