

## RESEARCH ON THE COAL BENEATH THE NETHERLANDS

### II-GEOLOGICAL/GEOPHYSICAL RECONNAISSANCE

#### 1. THE GEOLOGY OF COAL IN THE NETHERLANDS<sup>1</sup>

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Van der Harst, T.H. 1982 Geological/geophysical reconnaissance. 1. The geology of coal in The Netherlands. In: J.J. Dozy (ed.): Research on the coal beneath The Netherlands – Geol. Mijnbouw 61: 357-358.

A large part of the Northwest European coal basin is covered by the Netherlands. Most of the country, both onshore and offshore, is underlain by coal-bearing Carboniferous (Fig. 1).

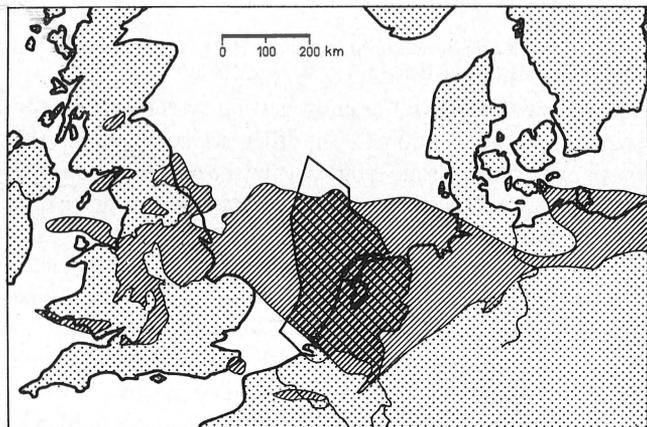


Fig. 1 Netherlands' part (cross hatched) of Northwest European coal basin (hatched). (After Dozy, 1979).

A regional cross-section, perpendicular to the dominant NW-SE structural trend, gives a general impression of the subsurface disposition of the coal measures (Fig. 2). The most complete sequence – some 3000 m comprising Westphalian A, B, C and lowermost D – is found in the Campine-Brabant basin in the SW. In other parts of the cross-section, the coal measures are strongly reduced by erosion. They occur at great depth over almost the whole length of the section, and in most of the country the top of the coal-bearing Carboniferous lies well below 1500 m (Fig. 3).

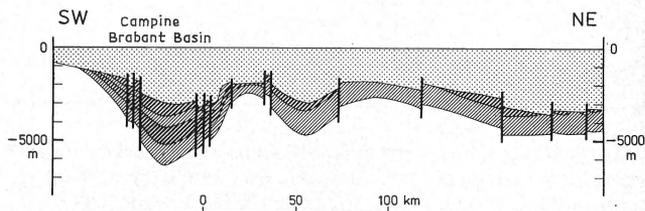


Fig. 2 Diagrammatic cross section through The Netherlands showing disposition of coal-bearing Carboniferous (Westphalian A, B, C and D; hatched) (After Dozy, 1979).

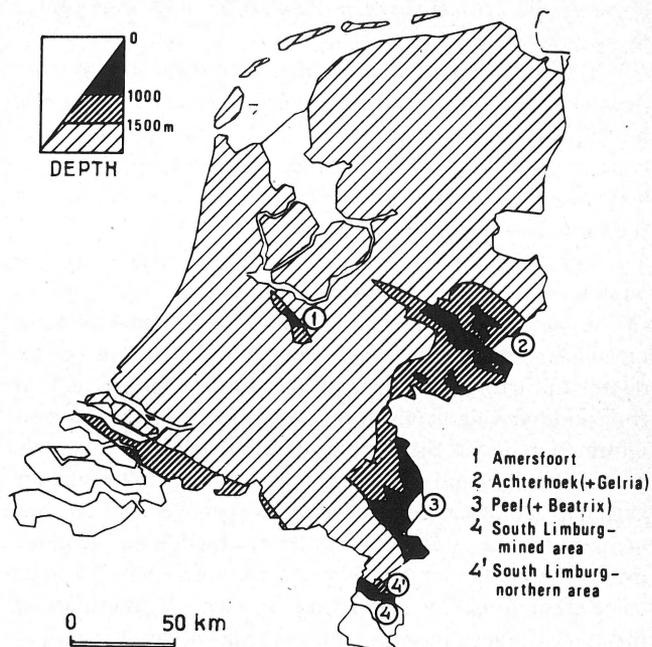


Fig. 3 Depth of top coal-bearing Carboniferous in The Netherlands. (After Dozy, 1979; Bless & De Voogd, 1980).

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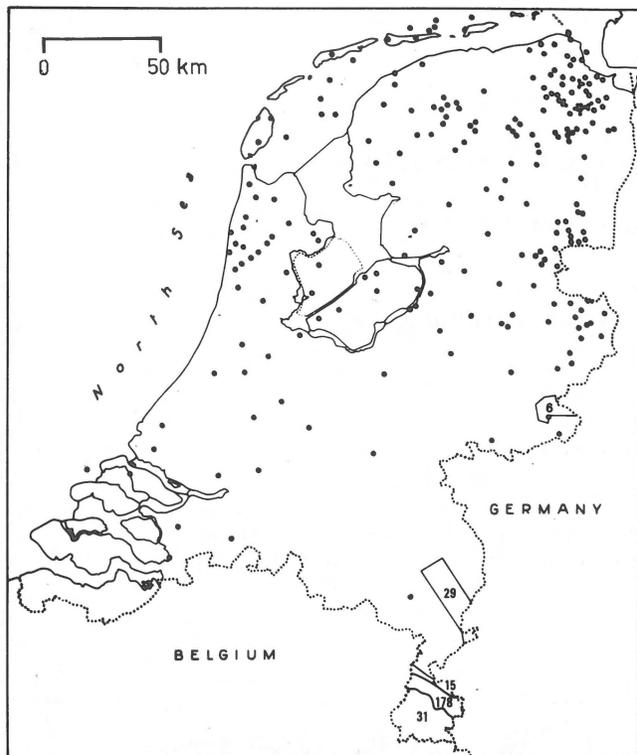


Fig. 4  
Exploration wells for oil and gas (dots) and coreholes drilled for coal (given as the number of holes drilled in exploration areas) that have reached the Carboniferous. (After Bless & De Voogd, 1980).

On technical grounds, a depth of roughly 1500 m is considered the maximum to which underground coal mining could conceivably be taken in future. The map (Fig. 3) shows therefore that by far the greatest part of the Netherlands' coal resources lie at depths where they could only be exploited through boreholes.

Whereas the exploitation of deep coal through boreholes may become feasible in the long term, a resumption of coal mining activities in one or more areas near the SE border with Germany lies closer at hand. Hence it is of interest to know to what extent the present geological data base can be used for the formulation of plans for these areas.

Looking first at the onshore territory as a whole, an impression of present geological information concerning coal can be gained from Figs 4 and 5. Exploration activities by the oil industry have established country-wide control on the depth and gross structure of the Carboniferous and its truncation during younger periods of erosion. However, information on the deep coal resources themselves is limited. Neither have oil and gas activities added much to the already available geological knowledge of prospective 'shallow' coal areas on the SE border. This latter knowledge was acquired over a period of more than 50 years, ending in 1959. The data come from coreholes and seismic surveys. As these are of pre-1960 vintage, their quality is mediocre by present-day standards. Reliable information is missing where it is needed most. This means that a proper selection of possible future production areas cannot be made.

A seismic and corehole drilling campaign by the Rijks

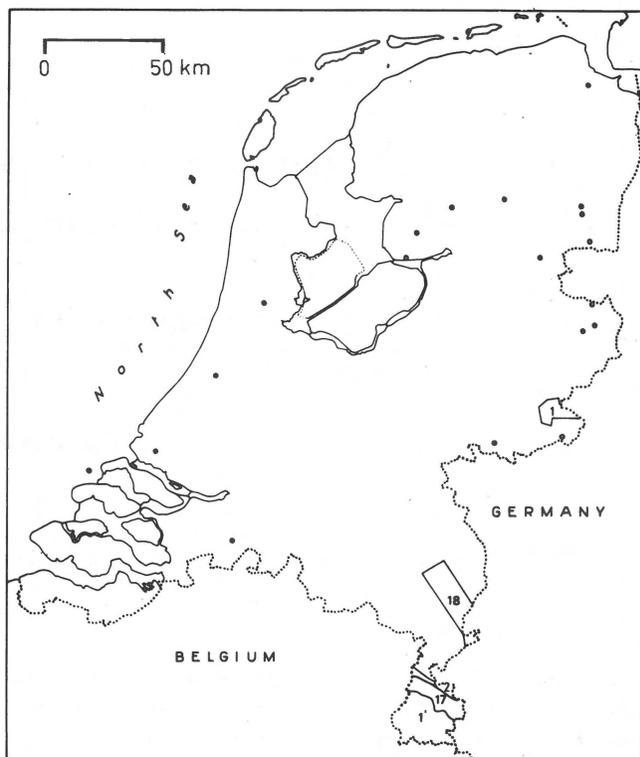


Fig. 5  
As Fig. 4, wells and boreholes penetrating 500 m or more below top Carboniferous. (After Bless & De Voogd, 1980).\*

Geologische Dienst is presently getting under way in the 'shallow' areas mentioned, in order to complement the existing data. Its prime objective is the investigation and ranking of potential future production areas, irrespective of possible production technologies.

Should a decision be taken in due course to re-engage in coal mining activities, then more detailed seismic work and additional boreholes will be needed for site selection and production planning purposes. Further data acquisition will remain an ongoing activity as exploitation proceeds. Close spacing is required because the geological hazards in underground coal mining can be considerable. Coals beds show unpredictable behaviour; they may thin abruptly, split up, and be cut off by faults or wash-outs. Such features have to be recognised in good time, preferably years in advance, for operations to proceed successfully. Carefully designed appraisal programmes using modern well-evaluation methods, supported by adapted seismic surveys and a commensurate production geological effort, will reduce costs and do much to safeguard and promote the efficiency of mining operations.

#### REFERENCES

- Bless, M.J.M. & N. De Voogd 1980 Exploration for coal in The Netherlands - Meded. Rijks Geol. Dienst, 33: 17-32.  
Dozy, J.J. 1979 Het Nederlandse probleem - Koninklijk Instituut van Ingenieurs & Energieonderzoek Centrum Nederland 1979 Steenkool onder Nederland: Energie voor de toekomst? - Symposium Koninklijk Geologisch en Mijnbouwkundig Genootschap, Koninklijk Instituut van Ingenieurs & Energieonderzoek Centrum Nederland, 's Gravenhage (04-10-1979): 1-18.