

# Fuel and energy, Geology and man, Midland Valley of Scotland

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Cameron, I B, and Stephenson, D. 1985. British regional geology: The Midland Valley of Scotland. Third edition. Reprint 2014. Keyworth, Nottingham: British Geological Survey.

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## Fuel and energy

### Coal

Coal remains the single most valuable natural resource in the Midland Valley despite the decline in production since the early part of the century. Maximum production took place in 1913 when 42 million tonnes were mined and numerous collieries were in operation. Few collieries are active at the present time and the total annual production from mining and opencast working is currently 11 to 12 million tonnes, mainly of bituminous coal.

The seams still being worked occur in the Limestone Coal Group of Namurian age and in the Lower and Middle Coal Measures of the Westphalian. In addition, there is an important seam in the Upper Limestone Group in the Kincardine Basin which is especially suitable for burning in power stations.

In the early years of the coal-mining industry, attention was concentrated on the more accessible seams at shallow depths. In many cases plans of these workings are not available and possible subsidence, due to the presence of voids at relatively shallow depths, is a major problem in relation to new construction projects.

Large areas of the coalfields are now no longer worked, partly through exhaustion and partly because the remaining coal cannot be worked economically by the mechanised methods currently in use in the industry. Untapped reserves still exist under parts of the Firth of Forth and in many areas there are seams suitable for opencast extraction.

### Oil-shales

The oil-shale industry of West Lothian, which flourished from the middle of the last century until its closure in 1962, was initiated by James 'Paraffin' Young. He obtained a patent for the production of 'Paraffin oil' in 1850 and set up a plant using, at first the Boghead Coal from the Lower Coal

Measures and then the oil-shales from the Dinantian in a process of destructive distillation to produce oil. The industry reached its maximum productivity in the early years of this century with annual outputs of more than 3.3 million tonnes of oil-shale. The yield of oil from a tonne of shale ranged between 70 and 200 litres.

The remaining resources of oil-shale in the Lothians are fragmented into small pockets by extensive former mining and by geological structure. The quantities of oil which could be recovered from the remaining shale are very small in comparison with today's rate of consumption.

## Oil and gas

Small quantities of oil and natural gas have been obtained from Dinantian rocks in the Lothians. The possibility that oil from the oil-shales had migrated and accumulated in sandstone reservoir rocks in the Lower Carboniferous attracted the interest of the oil companies. The main structure of interest has been the D'Arcy-Cousland anticline in Midlothian which has been investigated by drilling. Gas from one well was, at one time, fed into the town gas supply in Musselburgh and another well yielded about 3.5 barrels of oil per day. Both wells have now ceased production. A few other structures, including the Salsburgh Anticline near Airdrie, have also been drilled and small yields of gas obtained from horizons in the Calciferous Sandstone Measures.

## Geothermal energy

Preliminary investigations into the possibilities of tapping geothermal energy in the Midland Valley suggest that the western part of the area may be favourable. Rates of heat flow and the geothermal gradient approach minimal economic values locally and if a sufficiently permeable aquifer exists at a suitable depth there is the possibility of extracting energy. Experimental trials extracting heat from ground water taken from shallow boreholes have been carried out successfully and they demonstrate the possibility of meeting small-scale local demands for domestic or industrial space heating.

## Bibliography

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