

## Monetary valuation of oil and gas reserves

Expressing UK oil and gas reserves in monetary terms allows these subsoil assets to be compared with other economic entities. This provides a means for the commercial depletion of subsoil assets to be set against national income. The results in table 1.2 are shown in the form of a balance sheet.

Since observed market values for transactions *in situ* in their original state are not widely available, the present value method is used to put a monetary value on the physical stocks of assets. This is an indirect valuation method measuring the current value of the asset's future streams of income by discounting the expected future rent, often referred to as the economic rent or resource rent. The method relies on information about the size of resource rent, the number of years for which the rent is to be received and the social discount rate to be applied.

The resource rent is the net income from extraction defined as total revenue from sales less all costs incurred in the extraction process i.e. operating costs, depreciation of capital and an allowance for the return on capital. Decommissioning costs have not been included in these accounts. The rate of return on capital is estimated to be 8 per cent in real terms in line with Eurostat recommendations<sup>1</sup>, but it is worth noting that the resulting valuations are very sensitive to variations in this estimate. A three point centred moving average is used for the calculation of the unit resource rent.

The time span until the complete exhaustion of the reserves is the period over which resource rents are discounted, using the Eurostat recommended social discount rate of 4 per cent. Using these assumptions it is possible to calculate a present value of the stocks of oil and gas reserves at the start and end of each year. The accumulation account then breaks down the change between the start-of-year balance and the end-of-year balance. While physical stocks may change only as a result of extraction and other volume changes such as reassessments, monetary stocks can change for a number of other reasons.

Extraction is equal to the total resource rent for the year, effectively reducing the present value of the stocks by that amount. Positive values for extraction are a result of estimated negative resource rents. Revaluation due to time passing takes account of the fact that, as we move forward in time, the period over which the future rents are discounted is one year less, thereby reducing the effect of discounting future incomes. Other volume changes are reassessments which change the estimated stock of recoverable reserves.

The change in the extraction path sets out in monetary terms the addition or subtraction to the present value arising from a change in the amounts assumed to be extracted each year.

The change in unit rent gives the change in the future stream of income resulting from a change in the estimated unit resource rent. Any negative stock values result from estimated negative resource rents and have been left in the table in order to show the results of the assumptions made in the calculations.

1. European Commission (2000). *Accounts for subsoil assets: Results of pilot studies in European countries, 2000*. Office for Official Publication of the European Communities, Luxembourg