Yield / Production

Example

This table describes data on coal production in Mineshire

Mine	1980		2010	
	Coal (000s tonnes)	Employees	Coal (000s tonnes)	Employees
A	25.3	295	20.1	103
B	57.9	730	15.7	51
C	12.2	142	13.1	91

(i) In 2010, which mine was most efficient?

We have been given data for the number of employees and the amount of coal produced. The most efficient mine is the one that produces the most coal per employee. We calculate this for each mine

A 20.1 ÷ 103 = 0.195
B 15.7 ÷ 51 = 0.308
C 13.1 ÷ 91 = 0.144

Therefore the answer is Mine B.

Speed Tip!

1. *There is no need to change the coal figures to their proper units, as you are comparing 'like with like'.*
2. *You may have been able to guess the answer here, just by approximating the figures in your head.*

(ii) Approximately, what was the percentage change in average production per employee in Mine A between 1980 and 2010?

We already know that the average production per employee in Mine A in 2010 is 195 tonnes (remember, we need to multiply the figure above by its proper units. We calculate the same figure for 1980
25300 ÷ 295 = 86 tonnes (rounding the figure to an approximate value)

To calculate the percentage change in average production per employee, we first compute the difference (195 - 86 = 109) and calculate this as a percentage of the 1980 figure 109 ÷ 86 x 100 = 126.74 = 127%

That is, there is a 127% increase in average production per employee.

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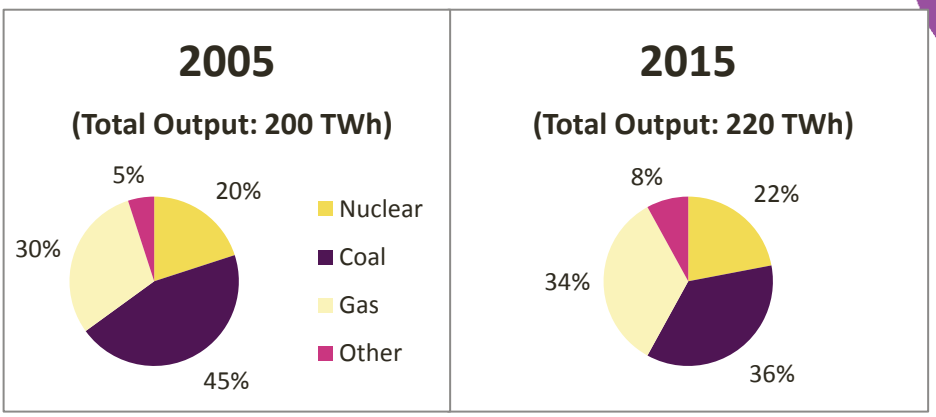
Example Energy Production



(i) If 350,000 litres of gas were used in energy production in 2005, and efficiency remained the same, how many litres of gas were used to produce energy in 2015?

In 2005, 350,000L of gas were used to produce 30% of 200 TWh. We calculate this amount of energy first 200 x 30% = 60 TWh

We next calculate what each litre of gas produced
60 ÷ 350000 = 0.000171428 TWh

In 2015, gas produced 34% of 220 TWh. Again, we calculate how much energy this is
220 x 34% = 74.8 TWh

Since efficiency remains the same, we can calculate how many litres of gas were used
74.8 ÷ 0.000171428 = 436334.8 = 436335L of gas

The answer is therefore 436,335 litres of gas.

(ii) Forecasters believe that energy production will increase by 6% from 2015 to 2025, and that nuclear energy will generate 27% of this energy. What will the total output from nuclear energy be in 2025?

First we need to calculate 106% of 220 TWh, to work out what total energy production in 2025 will be 220 x 106% = 233.2 TWh
Next we need to calculate 27% of this 233.2 x 27% = 62.964 TWh

Therefore 62.964 TWh will be produced by nuclear energy.

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