

'A Total Emissions Goal'

a) total emissions (T) = $(800 \times 10^9 \times 4) + (800 \times 10^9 \times 0.95) + (800 \times 10^9 \times 0.95^2)$

$$T = 4682 \times 10^9$$

[2 marks]

b) 5th year ($r = 5$): $T = 800 \times 0.95$

6th year ($r = 6$): $T = 800 \times 0.95^2$

therefore: $r = 0.95, n = r - 4$

$$T = 800 \times 0.95^{r-4}$$

[1 mark]

c) $S_n = \frac{a(1-r^n)}{1-r}$

$$S_{16} = \frac{760(1 - 0.95^{16})}{1 - 0.95}$$

$$S_{16} = 8510(.074636)$$

thus $T = 800 \times 4 + 8510$

$$T = 11.7 \times 10^{12} < 12 \times 10^{12}$$

Therefore the country meets their emissions target

[4 marks]