$$(E_b)_{net} = \sigma (T^4 - T_0^4) \quad \text{— (7)}$$

For Any body in general

$$E_{net} = \varepsilon (E_b)_{net} \Rightarrow E_{net} = \varepsilon\sigma (T^4 - T_0^4) \quad \text{— (8)}$$

$$E_{net} = \frac{\Delta Q}{A \cdot \Delta t} = \varepsilon\sigma (T^4 - T_0^4)$$

$$\boxed{\frac{\Delta Q}{\Delta t} = A\varepsilon\sigma (T^4 - T_0^4)} \quad \text{— (9)}$$

EXAMPLE: A black body of surface area 1 cm^2 is placed inside an enclosure. The enclosure has a constant temperature 27°C and the black body is maintained at 327°C by heating it electrically. What electric power is needed to maintain the temperature?

$A = 1 cm^2 = 1 \times 10^{-4} m^2$, $T_0 = 27°C = 300K$

$T = 327°C = (273 + 327) = 600K$