62. (a) The angular speed ω associated with Earth's spin is $\omega = 2\pi/T$, where $T = 86400\,\text{s}$ (one day). Thus

$$\omega = \frac{2\pi}{86400\,\text{s}} = 7.27 \times 10^{-5}\,\text{rad/s}$$

and the angular acceleration α required to accelerate the Earth from rest to ω in one day is $\alpha = \omega/T$. The torque needed is then

$$\tau = I\alpha = \frac{I\omega}{T} = \frac{\left(9.71 \times 10^{27}\right)\left(7.27 \times 10^{-5}\right)}{86400} = 8.17 \times 10^{28}\ \text{N}\cdot\text{m}$$

where we used

$$I = \frac{2}{5}MR^2 = \frac{2}{5}\left(5.98 \times 10^{24}\right)\left(6.37 \times 10^{6}\right)^2$$

for Earth's rotational inertia.

(b) Using the values from part (a), the kinetic energy of the Earth associated with its rotation about its own axis is $K = \frac{1}{2}I\omega^2 = 2.57 \times 10^{29}\,\text{J}$. This is how much energy would need to be supplied to bring it (starting from rest) to the current angular speed.

(c) The associated power is

$$P = \frac{K}{T} = \frac{2.57 \times 10^{29}\,\text{J}}{86400\,\text{s}} = 2.97 \times 10^{24}\ \text{W}\ .$$