

Calculating efficiencies: using energy in stores; using power in pathways.

A battery powered bicycle climbs a hill: stores and energy calculation

energy shifted to gravitational store = 25 megajoule

energy shifted from chemical store = 40 megajoule

energy shifted to thermal store = 15 megajoule

$$\begin{aligned}\text{Efficiency} &= \frac{\text{energy filling correct store}}{\text{energy depleting a store}} \times 100\% \\ &= \frac{25 \text{ megajoule}}{40 \text{ megajoule} + 15 \text{ megajoule}} \times 100\% \\ &= 62.5\%\end{aligned}$$

A battery powered bicycle climbs a hill: pathways and power calculation

Power in electrical pathway = 120 watt

Power in mechanical pathway = 75 watt

Power in heating pathways = 45 watt

$$\begin{aligned}\text{Efficiency} &= \frac{\text{power in correct output pathway}}{\text{power in input pathway}} \times 100\% \\ &= \frac{75 \text{ watt}}{120 \text{ watt}} \times 100\% \\ &= 62.5\%\end{aligned}$$