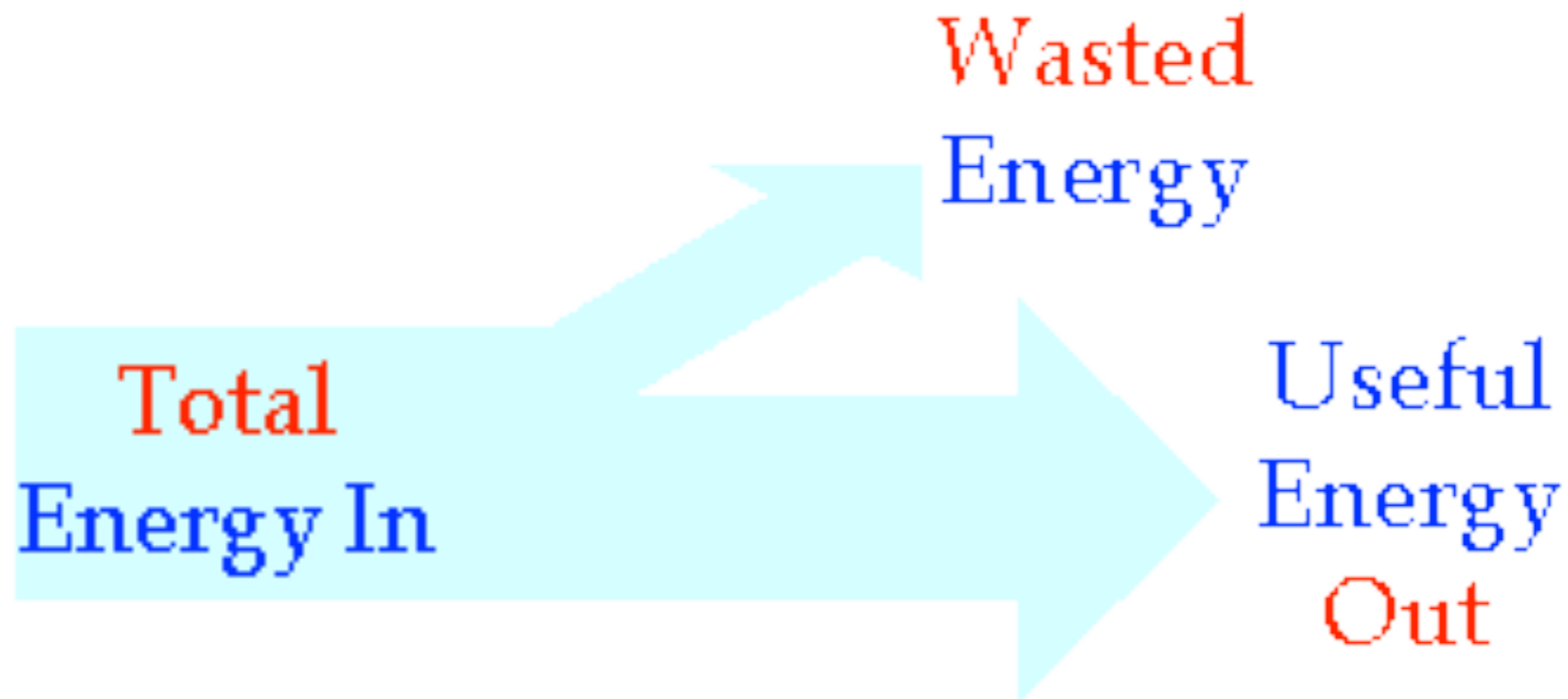


Energy Flow Diagrams

- There are many types of process which transfer energy
- The transfer of energy can be shown by a flow diagram (also called a Sankey diagram).



- Efficiency is a measure of how well a device transfers energy into the form we want
- $\text{efficiency (\%)} = (\text{useful energy out} \div \text{total energy in}) \times 100$ or
- $\text{efficiency (\%)} = (\text{useful power out} \div \text{total power in}) \times 100$
- Efficiency is not the same as cost-effectiveness.
- When energy is transferred, some of the energy turns into forms we don't want. This energy is called wasted energy

- Wasted energy takes the form of heat and sometimes sound or light. During any energy transfer, some energy is changed into heat.
- The heat becomes spread out into the environment
- This dispersed or dissipated energy becomes increasingly difficult to use in future energy transfers. In the end, all energy is transferred into heat.
- *In the end, all energy is transferred into heat.

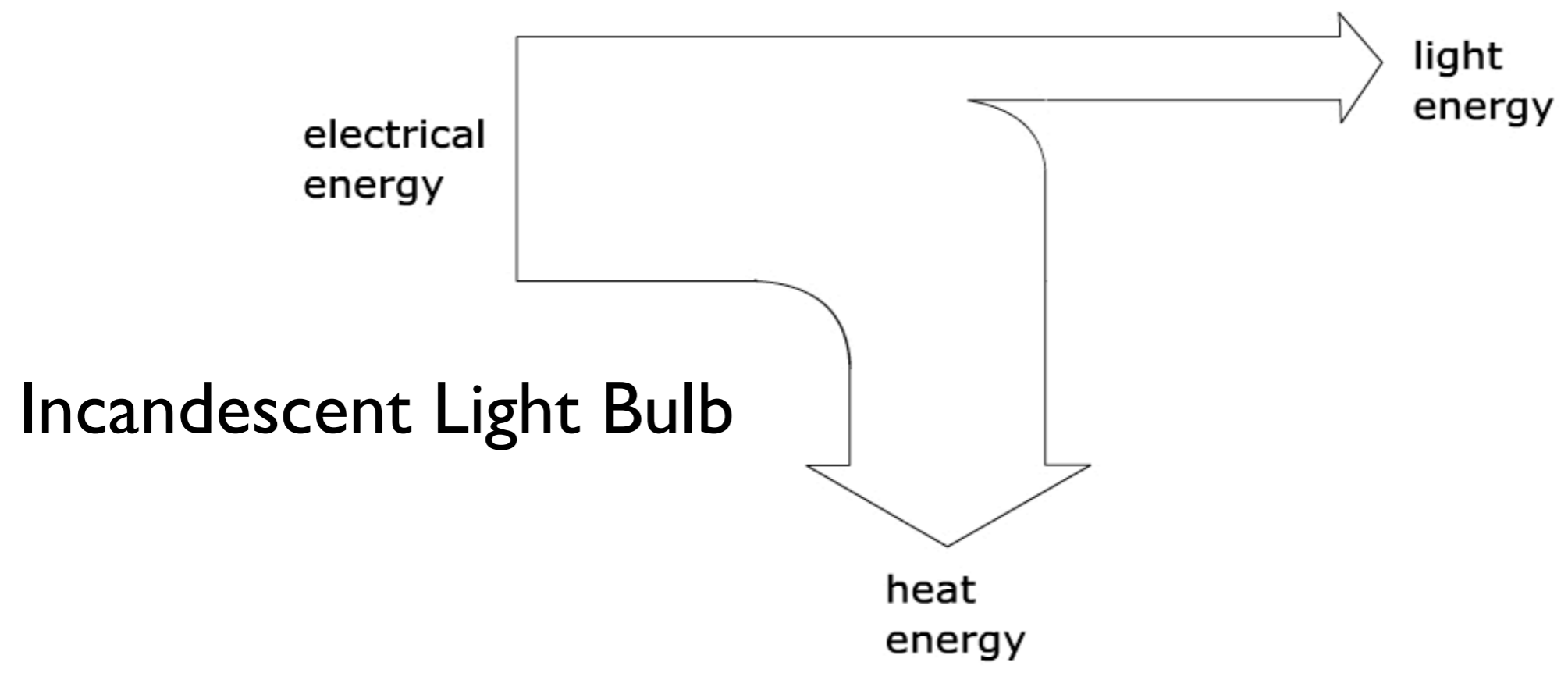
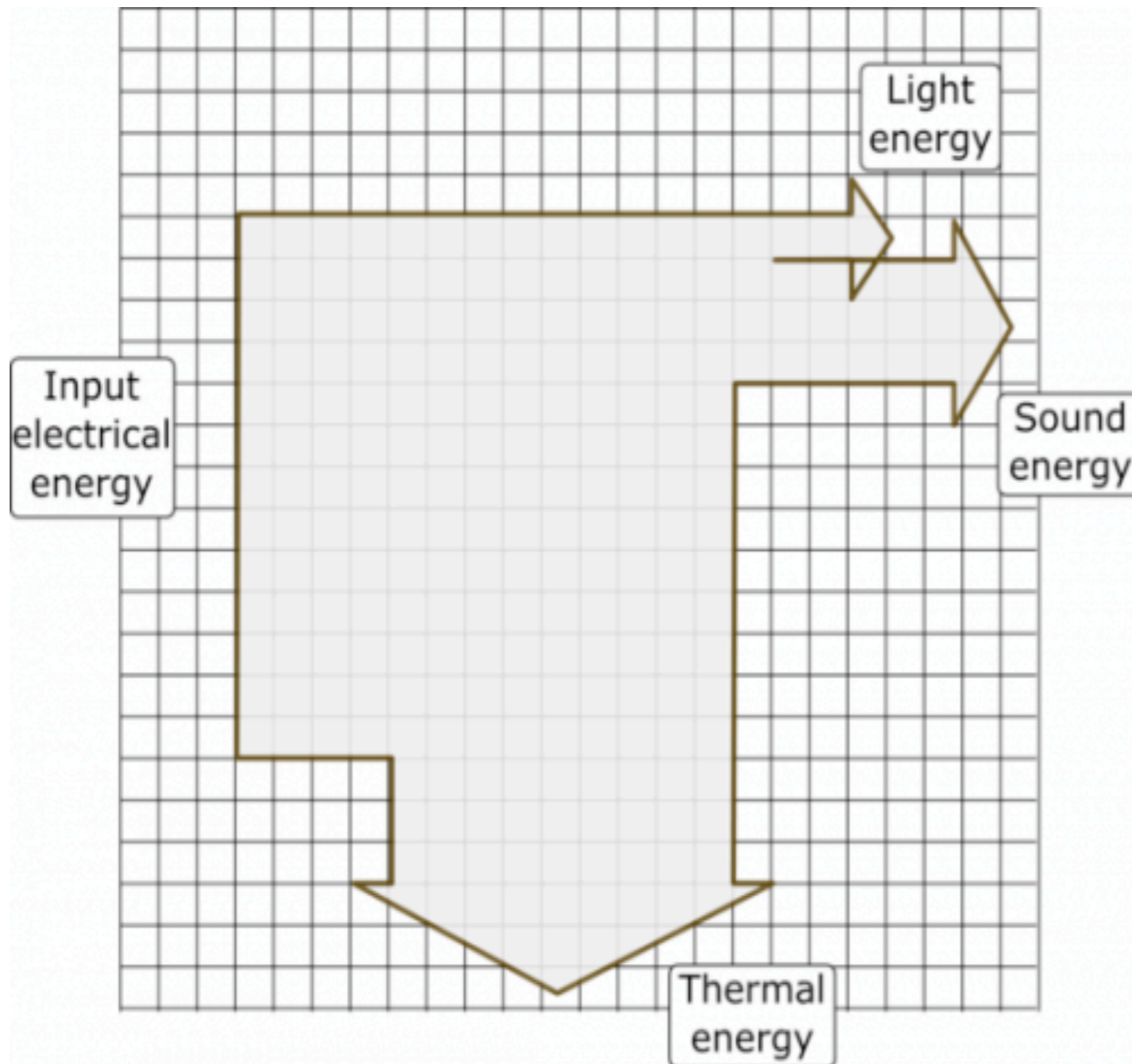


Diagram a cartoon providing a Sankey Diagram with a picture. Describe how this supports the LOCOE

Ipad



filament bulb



✓ show efficiency calculation

$$\text{efficiency (\%)} = \frac{\text{useful energy output}}{\text{total energy input}} \times 100 = \frac{9}{100} \times 100 = 9\%$$

Sometimes light bulbs are used to light and heat the environment (e.g. in a reptile house or vivarium). In this situation the efficiency would be virtually 100 %.