

Source: [KBhPHYS201CircuitsIndex](#)

1 | Capacitors

1.1 | Capacitors vs. Batteries

Batteries => Converting PE_{chem} => Electrical energy

Capacitors => Converting PE_{elec} => Electrical energy

When you are discharging a battery, they remain at constant voltage until they are used up, at which point the voltage drop like a plate.

When you are discharging a capacitor, there is a linear fall in voltage that is constant.

Charge remaining: capacitance times voltage

1.2 | Energy on a Capacitor

Energy stored on a capacitor: $E = \frac{V_c \cdot Q}{2}$.

Charge on a capacitor: $Q = C \times V_c$

Farads: $F = \frac{C}{V}$

So, putting this together, the energy stored on a capacitor would be...

$$\text{Definition 1} \cdot \text{Energy stored in a capacitor } E = \frac{V \times Q}{2} = \frac{CV^2}{2}$$

as $Q = C \times V_c$

$Q_{cap} \propto V$. In fact $Q_{cap} = C \times V_c$.