



Establishing a current in the inductor requires work.

The work done is equal to the potential energy stored in the inductor.

- Current through inductor: I (increasing)
- Voltage induced across inductor: $|\mathcal{E}| = L \frac{dI}{dt}$
- Power absorbed by inductor: $P = |\mathcal{E}|I$
- Increment of potential energy: $dU = Pdt = LI dI$
- Potential energy of inductor with current I established:

$$U = L \int_0^I IdI = \frac{1}{2} LI^2$$

Q: where is the potential energy stored?

A: in the magnetic field.